THE COTTON GIN AND OIL MILL

PRESS

FORMERLY THE COTTON AND COTTON OIL PRESS

53rd YEAR

MARCH 1, 1952

THE MAGAZINE OF THE COTTON GINNING AND OILSEED PROCESSING INDUSTRIES

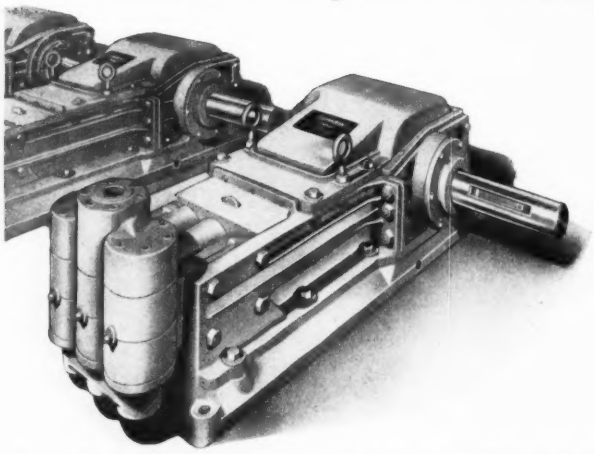
5th ANNUAL COTTON INSECT CONTROL ISSUE

ANOTHER 16,000,000 BALE GOAL IN 1952 CALLS FOR ANOTHER CONCENTRATED ATTACK ON COTTON INSECTS!

NEW! COTTON'S MAJOR *BENEFICIAL* INSECTS IN COLOR!

SEE CENTER SPREAD THIS ISSUE

LUMMUS *Speedex* HYDRAULIC PUMP



It is new. It has capacity enough for two or three rams. Completely enclosed, self-lubricated. Roller bearing crank-shaft. Insert type connecting rod bearings. Permanent type packing. Engineered for long, trouble-free service. A truly modern pump. Write for Bulletin #642 which has all the details.

LUMMUS COTTON GIN CO.

Lummus is doing more to put gins on a better paying basis.

Dallas, Texas Columbus, Georgia Memphis, Tennessee

You Save on Power Costs with a
CONTINENTAL GINNING SYSTEM OUTFIT

Continental System Ginning Outfits do a top-notch drying, cleaning and ginning job with *fewer fans* than many other outfits. This feature of design not only results in a savings on the cost of the fans but also a substantial savings in power costs since in some gin plants more power is consumed by the fans than all other machinery combined.

Economical power use is only one of many outstanding and distinctive features which have won for Continental System Ginning Outfits the universal acclaim of ginners wherever cotton grows.

CONTINENTAL GIN COMPANY

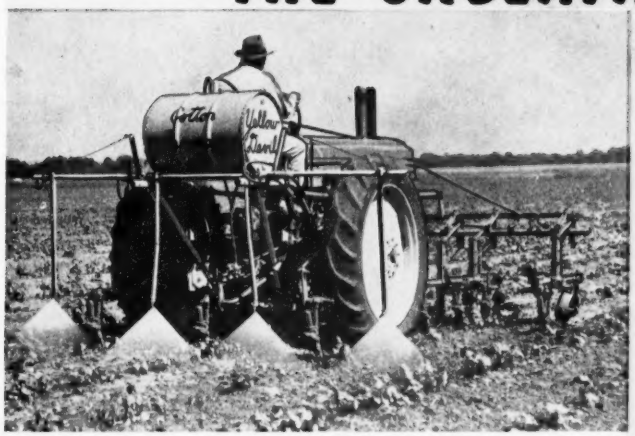
BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • MEMPHIS

Entered as second-class matter February 4, 1905, at the Post Office at Dallas, Texas, Under Act of Congress of March 3, 1897

YELLOW DEVIL Southwest Cotton Sprayers... Insecticides

THE UNBEATABLE TEAM!

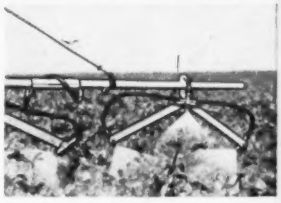


YELLOW DEVIL SPRAYERS plus SOUTHWEST POISONS... The easy — quick — sure — low-cost way to WHIP COTTON PESTS! The Yellow Devil Cotton Sprayer has the features you would include if you were building a cotton sprayer made to order for yourself. At your local SOUTHWEST dealer... see the YELLOW DEVIL, the first and foremost sprayer of the Cotton South. SPARE PARTS AVAILABLE.

Ask to see the new Yellow Devil Directional Sprayer, "The Chemical Hoe," designed to control weeds while cultivating.

Above: Early season insect control with the Yellow Devil, using four-row, one nozzle per row applications.

Right: Late season insect control with the Yellow Devil. A simple adjustment gives three nozzle per row applications.



TOXAPHENE

TOXAPHENE-DDT

DDT

TEPP

ALDRIN

Southwest *Agricultural Insecticides* are formulated by pioneers in the field of low-gallonage cotton spraying. They are carefully manufactured, stable in hard or soft water, and stand up under storage. You can be SURE if you use dependable SOUTHWEST Poisons.

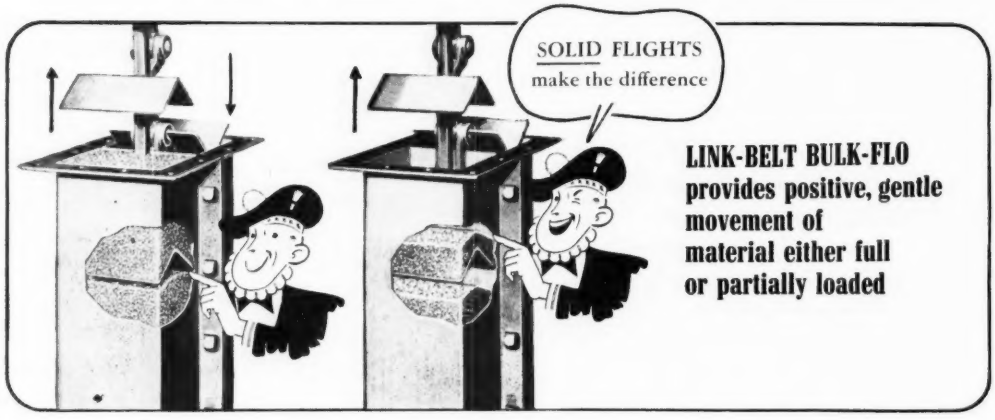
★ *Listen to* MURRAY COX *with the latest farm news, Tuesdays and Thursdays, 6:45 to 7:00 A.M. over Radio Station WFAA-570.*

Southwest Sprayer and Chemical Co

A limited number of SOUTHWEST dealerships now available. Write or phone for complete details.

901 Peach St. P. O. Box 487 Waco, Texas

Combined feeder · conveyor · elevator cuts your handling costs



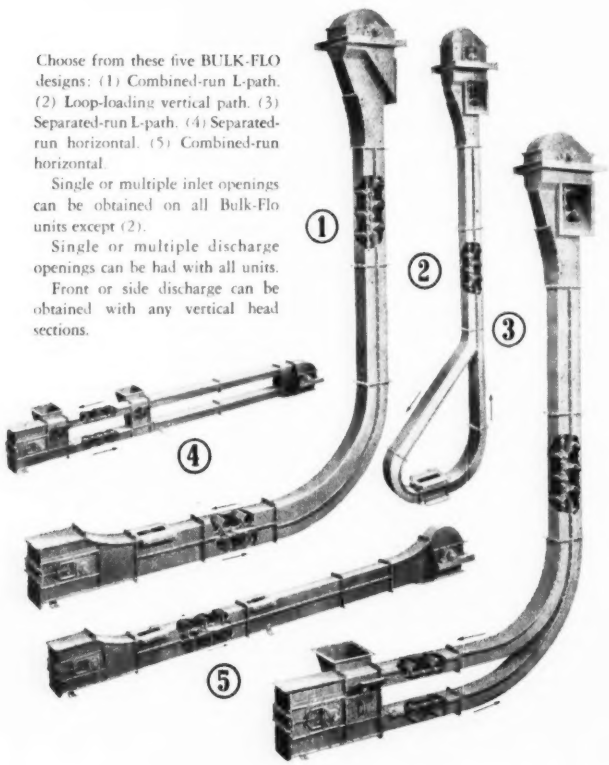
LINK-BELT BULK-FLO provides positive, gentle movement of material either full or partially loaded

Choose from these five BULK-FLO designs: (1) Combined-run L-path. (2) Loop-loading vertical path. (3) Separated-run L-path. (4) Separated-run horizontal. (5) Combined-run horizontal.

Single or multiple inlet openings can be obtained on all Bulk-Flo units except (2).

Single or multiple discharge openings can be had with all units.

Front or side discharge can be obtained with any vertical head sections.



BULK-FLO gives you true versatility in bulk materials handling . . . at lower cost. It replaces several units in less space . . . cuts initial outlay. And because *solid flights* operate independently of internal pressure, BULK-FLO can be operated at less than full capacity, with positive movement of materials.

That means capacity can be varied by regulating the feed. It also means gentler handling —material is protected in individual "compartments" to minimize degradation.

And note this—regardless of the amount of material being fed, BULK-FLO is self-clearing through intermediate runs. This feature allows you to alternate batches of different materials and prevents contamination.

You can get complete information on BULK-FLO from the Link-Belt office near you. Or write for your copy of Book 2175.

LINK-BELT

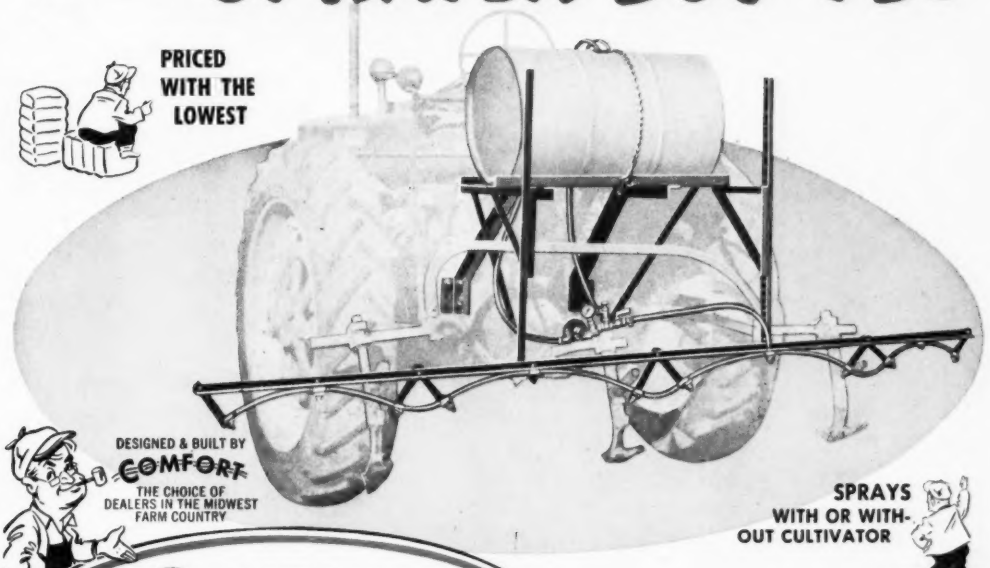
BULK-FLO
FEEDERS - CONVEYORS - ELEVATORS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in Principal Cities. 12,082

NOW FOR THE COTTON COUNTRY

THE GREATEST SPRAYER BUY YET

PRICED WITH THE LOWEST



DESIGNED & BUILT BY COMFORT
THE CHOICE OF DEALERS IN THE MIDWEST FARM COUNTRY

SPRAYS WITH OR WITHOUT CULTIVATOR

COMFORT T. M. Reg.
CULTIVATOR MOUNT
COTTON SPRAYER
PATENT PENDING

Dealers Prefer The Leader in Sales. In independent surveys conducted by a leading dealer publication and 7 leading state farm papers, more dealers in 9 leading farm states expressed a preference for COMFORT Sprayers over any of more than 70 other brands.

That's pretty good evidence this new COMFORT Cotton Sprayer is worth investigating yourself. It's tested and proved, backed by a dependable manufacturer, and priced to attract customers. So get the facts on COMFORT today.

1 Easy to mount with or without cultivator.
2 Engineered for attachments for other crop spraying. Adjustable nozzle spacing for any width row. Adjustable boom height.
3 Extension booms available to convert standard 2-row model to 4 or more rows as illustrated above.
4 Complete with adjustable drops for between-row spraying.
5 Hollow cone tips (specified by cotton spraying experts) standard equipment.
6 Full floating gear operated positive pressure pump.
7 Chemical resistant hose. Rugged construction throughout.
8 Complete—nothing else to buy. Uses any standard 55 gal. drum (not furnished.)

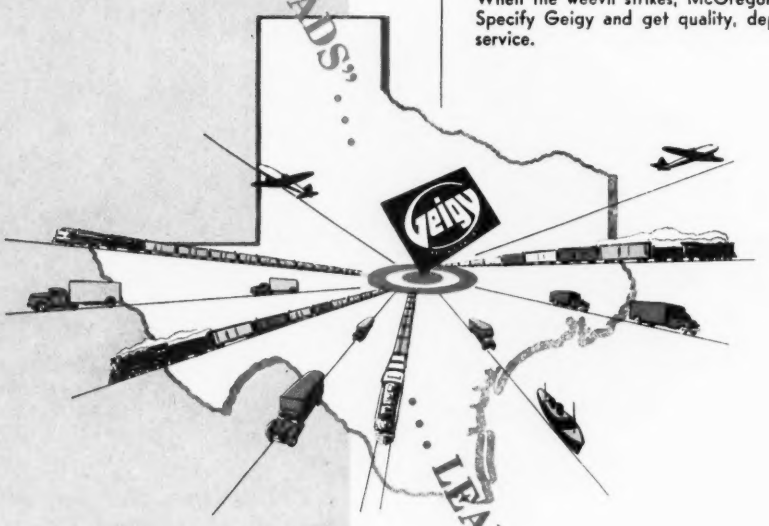
MAKERS OF COMFORT
MULTI-PURPOSE FARM SPRAYERS
BOOM JET SPRAYERS for INSECTICIDE and RIGHT-OF-WAY SPRAYING
COMPLETE PARTS and ACCESSORY SELECTION

A GENUINE COMFORT PRODUCT

Order through Your Jobber or Write Direct

Manufactured by
COMFORT EQUIPMENT COMPANY
2609-PP Walnut Kansas City 9, Mo.

ALL "COTTON ROADS" . . .



. . . LEAD FROM McGREGOR

When the weevil strikes . . .

Trucks and freight trains will hurtle over the fertile lands of North and East Texas . . . flash across the Great Plains of the West . . . and race to the coastal regions and the Rio Grande. They'll be en route to the front lines loaded with Geigy insecticides — a cargo of death for Mr. Weevil and other cotton pests.

Behind the lines Geigy's McGregor plant will be working quietly, efficiently. The carriers will rumble in and out day and night with the dusts and liquids that control cotton pests effectively and economically.

When the weevil strikes, McGregor will be ready. Specify Geigy and get quality, dependability and service.

- Aldrin—DDT dusts & sprays*
- BHC—DDT dusts & sprays*
- 25% DDT emulsion concentrate
- Toxaphene dusts & sprays*
- Toxaphene—DDT spray
- 25% Parathion emulsion concentrate

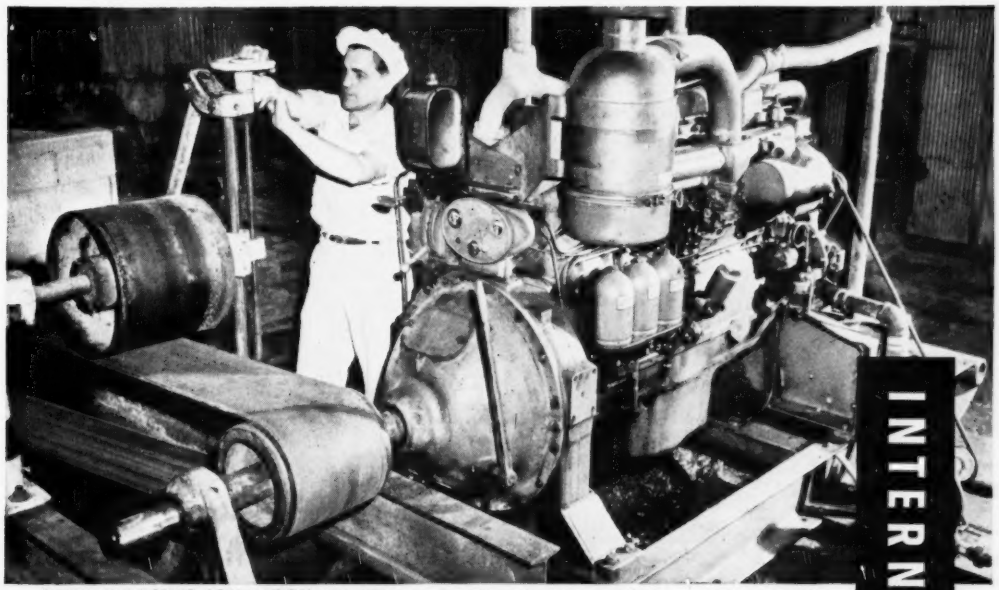
*(dusts available with sulphur)

ORIGINATORS OF Geigy DDT INSECTICIDES

GEIGY COMPANY, INC.
McGregor Texas

Aberdeen, N. C.; Burlington, Iowa; Colorado Springs, Colo.; Elkton, Md.; Fresno, Calif.; Houlton, Me.; Leland, Miss.; New York, N. Y.; Orlando, Fla.; Walla Walla, Wash.

"EASIEST to start QUICKEST under way"



WHERE THE POWER COMES FROM. This UD-24 really delivers for Cox: runs fans, presses, blowers and cleaners plus his 3-stand, 80-saw gin that goes 5 bales per hour on 12-hour-a-day schedule.

. . . that's how Cox Cotton Company compares International with three other makes

There's no profit in cotton ginning until the cotton starts going through. Through lost time, slow starting engines can make a big dent in profits before you know it.

That's why ginners like Cox Cotton Company, Pocahontas, Arkansas, pay attention to the way an engine starts. And that's why they like International. Here's what the owner says: "We like the easy starting of the UD-24 and find it has plenty of power to get the job done. Of the four power units we have, International is quickest and easiest to get under way."

The exclusive gasoline-conversion starting system of all International diesel engines lets them pull a full gin load after a few seconds warm-up . . . even on the coldest morning.

Just count up the production minutes you may be losing through slow-starting engines that just won't "take hold" in the morning. For full specifications and performance facts on the complete International line of Power that Pays, see your International Industrial Distributor or Power Unit Dealer.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL

INTERNATIONAL HARVESTER

POWER THAT PAYS

Laugh IT OFF

An old Frenchman who admitted to 108 years said to the reporter, "Good eating and good drinking is what has preserved me. Wine is the only beverage for sensible humans. Why am I in such perfect health? Well, not a drop of water has ever passed my lips."

"I don't believe that," said the reporter. "Don't you ever brush your teeth in the mornings?"

"For that," replied the old gentleman, "I use a light sauterne."

•

He: To me, love is peace, quiet, dreamlike tranquility!

She: You're crazy! That ain't love. That's sleep!

•

Shocked Old Lady: "And on my way we passed about 25 people in parked cars."

Young Hostess: "Oh, I'm sure you are mistaken. There must have been an even number."

•

The manager of a radio station addresses this simple letter to delinquent clients:

"Dear Mr.—: Will you please send us the name of a good lawyer in your community? We may have to sue you. Yours very truly . . ."

•

Mother (to school teacher): "My Richard is a very sensitive child. If you need to punish him, just slap the boy in the next seat—this will frighten Richard."

•

The district superintendent of a railway branch line had always made a point of insisting that stationmasters should send in a full report at once of any accident, however small. One morning he received the following urgent message: "Man fell from platform in front of moving train. Will send further details later."

After waiting for what seemed an age, the superintendent received the second message: "Everything O.K. Nobody hurt. Engine going backwards."

•

A squaw and papoose were on the platform at a small town stop in South Dakota when the train pulled in. A man from the East, pointing his finger at the papoose, inquired, "Him Injun?"

"Him part Injun, part injineer!" replied the squaw.

•

A man who follows the horses generally finds that the horses he follows follow the other horses.

•

Boss: "What's that big item on your expense account?"

Salesman: "That's my hotel bill."

Boss: "Well, don't buy any more hotels."

•

Judge—"For hitting your wife the fine will be $1.10."

Mechanic—"I don't mind the dollar, but what's the ten cents for?"

Judge—"Amusement tax."

•

"That girl frankly admits she is looking for a husband."

"So am I."

"Why I thought you had one!"

"I have, and I spend most of my time looking for him."

Cotton farmers . . .

GET THE JUMP ON THRIPS,
CUTWORMS, FLEAHOPPERS,
OVERWINTERING WEEVILS

Be prepared . . .

WITH ENOUGH POISON TO
MEET THE FIRST ATTACK
OF THESE PROFIT-EATERS

Buy toxaphene . . .

THE POISON THAT
KILLS COTTON INSECTS

This advertisement is being seen by more than 1,000,000 readers of:
ACCO PRESS
PROGRESSIVE FARMER

Write us for your toxaphene cotton booklets. Don't fail to see the new full-color movie on control of cotton insects. Write Hercules, or see your county agent for dates of showings in your community.

HERCULES POWDER COMPANY

Naval Stores Department, 943 King Street, Wilmington, Delaware

THE CHEMICAL BASE FOR TOXAPHENE IS PRODUCED BY HERCULES FROM THE SOUTHERN PINE

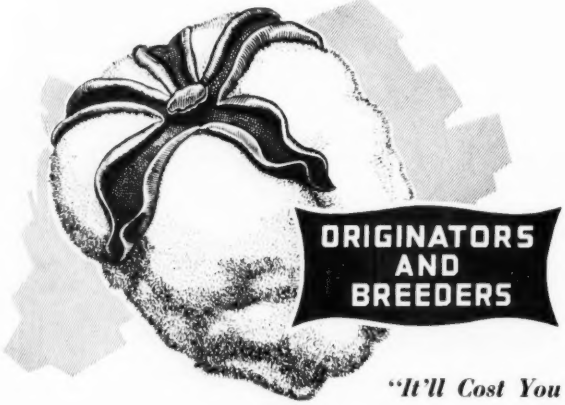
NX52-4R

After you kill the insect-what?

The importance of good insect control in the production of cotton cannot be overestimated. Today, outstanding progress is being made along these lines. Everyone in the cotton industry should pay sincere tribute to those individuals and firms who are contributing their knowledge and skill to better insect control.

However, without good seed, top production is not possible, even with the finest type of insect control. That is why the staff at Stoneville Pedigreed Seed Company is working constantly on the important job of developing, maintaining and producing pure bred foundation seed stock of the highest quality. We are proud of the continuing success won by famous "Stoneville" and "Delfos" cottons . . . cottons which have built a strong tradition of quality and dependability.

Most recent example of this superiority is found in the fact that Stoneville's Delfos 9169 won top honors both in the 1951 Mississippi 5-Acre Cotton Contest and in Mississippi mechanization tests.



STONEVILLE AND DELFOS COTTONS

"It'll Cost You Less To Plant the Best"

STONEVILLE PEDIGREED SEED COMPANY, INC.

Stoneville, Mississippi

Plan Now!

RED PANTHER
BRAND
COTTON DUSTS and SPRAYS
for EVERY PURPOSE

Protect YOUR BIGGEST CASH CROP!

THE STANDARD INSECTICIDES OF THE COTTON BELT

RED PANTHER BRAND SPRAY EMULSIONS

4 lb. Toxaphene Emulsion Concentrate
6 lb. Toxaphene Emulsion Concentrate
8 lb. Toxaphene Emulsion Concentrate
2 lb. Aldrin Emulsion Concentrate
1½ lb. Dieldrin Emulsion Concentrate
25% DDT Emulsion Concentrate

RED PANTHER BRAND DUSTS

3-0-0 Benzene Hexachloride
3-5-0 Benzene Hexachloride-DDT
3-5-40 BHC-DDT-Sulphur
20-0 Toxaphene Dust
20-40 Toxaphene Dust
2½-0-0 Aldrin Equivalent Dust
2½-5-0 Aldrin Equivalent Dust
2½-5-40 Aldrin Equivalent Dust
1½-0-0 Dieldrin Equivalent Dust
1½-5-0 Dieldrin Equivalent Dust
1½-5-40 Dieldrin Equivalent Dust

COAHOMA CHEMICAL CO., CLARKSDALE, MISS.

Consult YOUR COUNTY AGENT See YOUR NEAREST RED PANTHER DEALER

From the Farms of America...

WHEN HOMEMAKERS TRY different brands of margarine they sooner or later hit on Allsweet. Then their search for flavor suddenly ends. For there is no artificial flavoring in Allsweet. Its flavor is delicate, *natural*.

And no wonder. A true farm product, Allsweet is made from clear rich food oils blended—by an exclusive process—with cultured pasteurized skim milk.

So always ask for Allsweet —the margarine with the delicate *natural* flavor.

•

SWIFT & COMPANY

THE COTTON GIN AND OIL MILL

PRESS

53rd YEAR

THE MAGAZINE OF THE COTTON GINNING AND OILSEED PROCESSING INDUSTRIES

Volume 53 **March 1, 1952** **Number 5**

Published every other Saturday in our own printing plant at 3116 Commerce Street, Dallas 1, Texas

Officers and Editorial Staff

RICHARD HAUGHTON
Chairman of the Board

DICK HAUGHTON, Jr.
President and Advertising Manager

GEORGE H. TRAYLOR
Executive Vice-President and Secretary-Treasurer

IVAN J. CAMPBELL
Vice-President and Editor

B. P. RIDGWAY
Vice-President and General Superintendent

PAULA FIX
Editorial Assistant

Washington Representative (Editorial Only)
FRED BAILEY
740 Jackson Place, N.W.
Washington 6, D. C.

•

Official Magazine of:

National Cottonseed Products Association

National Cotton Ginners' Association
Alabama Cotton Ginners' Association
Arizona Ginners' Association
Arkansas-Missouri Ginners' Association
California Cotton Ginners' Association
The Carolinas Ginners' Association
Georgia Cotton Ginners' Association
Louisiana-Mississippi Cotton Ginners' Association
New Mexico Cotton Ginners' Association
Oklahoma Cotton Ginners' Association
Tennessee Cotton Ginners' Association
Texas Cotton Ginners' Association

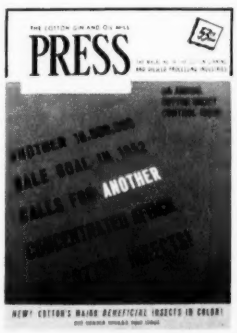
The Cotton Gin and Oil Mill Press *is the Official Magazine of the foregoing associations for official communications and news releases, but the associations are in no way responsible for the editorial expressions or policies contained herein.*

•

Subscription Rates: 1 year $3; 2 years $5; 3 years $7; foreign $3.50 per year.
Executive and Editorial Offices: 3116 Commerce St., Dallas 1, Texas

The Cover

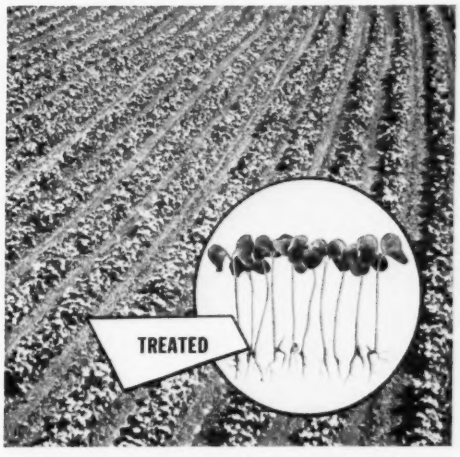
THE DEADLINE approached for getting art prepared on the cover of the 5th Annual Insect Control Issue. Let's see, we reflected, the first one, five years ago, was a cartoon-style job, next was a photograph of an airplane dusting cotton, then came a stylized drawing of a vicious-looking boll weevil, and last year we dedicated the issue to "Mr. Insect Control"—K. P. Ewing, of Waco, Texas, and ran his picture on the cover. That pretty well covered the various approaches. Well, we thought, why not a direct, strong statement—dramatized a little —telling our readers in a few words what the *need* is, insect-control-wise, for 1952. So that's what we did, asking for *"another* concentrated attack on cotton insects" during the season ahead.



A PROGRESSIVE AND RESPONSIBLE PUBLICATION
READ BY COTTON GINNERS, COTTONSEED CRUSHERS AND OTHER OILSEED PROCESSORS FROM CALIFORNIA TO THE CAROLINAS

A Good Start For A

BETTER COTTON CROP



BE SURE ALL SEED IS TREATED PROPERLY WITH CERESAN®

This Du Pont Seed Disinfectant Reduces All These Diseases:

1. Seed Decay. Attacks untreated seed before it can germinate. "Ceresan" kills these organisms so the seed has a better chance even in cold, wet weather.

2. Sore Shin. Kills seedling plants by attacking at ground level. "Ceresan" destroys these organisms so more sprouts can keep growing.

3. Angular leaf spot. Carried on the seed or spread by wind from infected plants. "Ceresan" controls seed-borne leaf spot and thereby removes this source of infection.

4. Anthracnose boll rot. Winters over on seed and in old stalks and bolls. "Ceresan" kills the spores on the seed and thereby cuts down that source of infection.

USE TREATED GRAIN AND GRASS SEED, TOO

"Ceresan" seed treatment for grain controls seed rot, seedling blights, many kinds of smut on wheat, oats, barley and rye. Helps produce better stands and better yields of clean grain.

"Arasan" seed treatment for grass and legumes controls seed rot and seedling blight, helps these tiny seeds to get a strong start. Improves stands and vigor resulting in better yields and pasture crops.

RECOMMENDED TREATMENTS

MECHANICALLY DELINTED COTTONSEED

2% "Ceresan"	Dry	6 oz./100 lbs.
"Ceresan" M	Dry or Slurry	3 oz./100 lbs.

ACID-DELINTED COTTONSEED

2% "Ceresan"	Dry	4 oz./100 lbs.
"Ceresan" M	Dry or Slurry	2 oz./100 lbs.

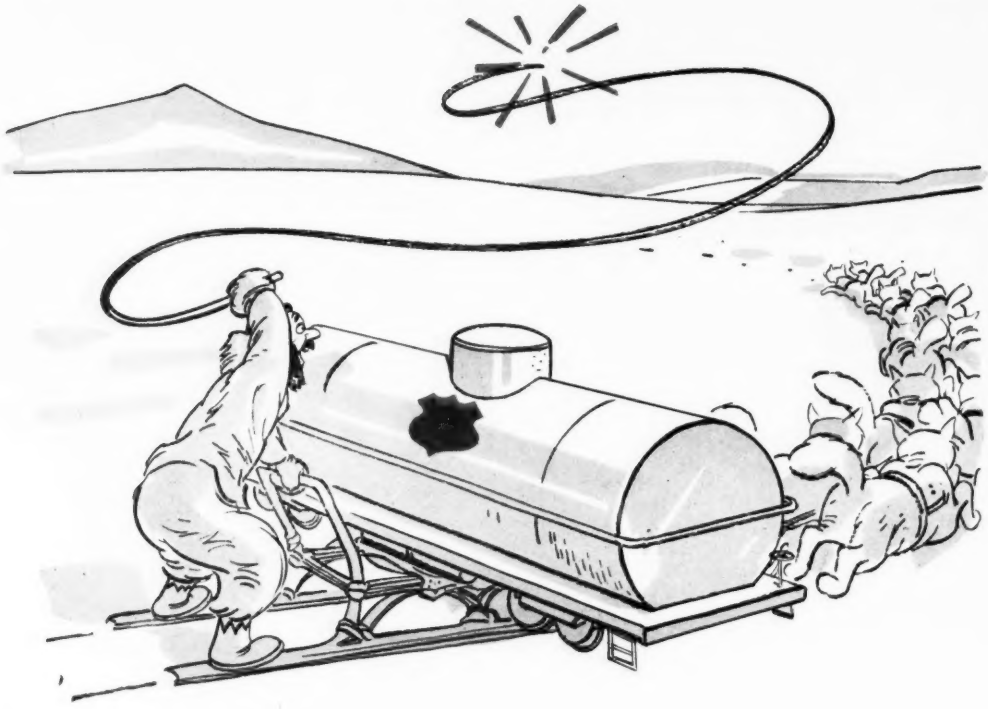
FUZZY COTTONSEED

2% "Ceresan"	Dry	9 oz./100 lbs.
"Ceresan" M	Dry or Slurry	4½ oz./100 lbs.

DU PONT REG. U.S. PAT. OFF. **CERESAN®**

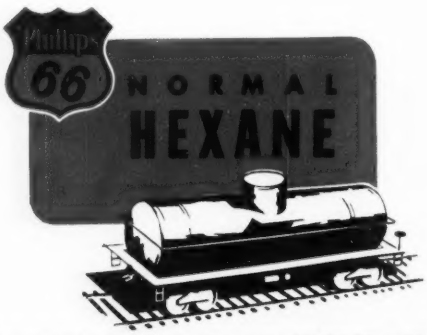
Seed Disinfectant and Protectant

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



It Must Go Through!

PHILLIPS PETROLEUM COMPANY doesn't get "snowed-under" with transportation problems. Not only are we the world's largest producer of Hexane, but we have the facilities to get it through to you when and where you want it.



Phillips *66* Normal Hexane is an exceptionally *fine* extraction solvent, too. With a very narrow boiling range (typical spread only 5°) there are no light ends to lose and no heavy ends to be left in the meal. And Phillips water-white solvents are so pure they leave no contaminating taste or odor to taint your product.

So reduce those operating headaches . . . lessen readjustments in your plant. These rigidly controlled solvents made by Phillips can give you the same good results every time.

Write us for advice on your solvent problem: soybean, cottonseed, flaxseed, tung nut, rice bran, corn germ, castor bean, alfalfa, animal fat or any other oil extraction industry.

●

PHILLIPS PETROLEUM COMPANY

SPECIAL PRODUCTS DIVISION • BARTLESVILLE, OKLAHOMA

A QUICK-MATURING, high-yielding variety of cotton, planted on good land and protected with the right insecticides at the right time, spells profit for the grower, the ginner and the oil miller.

In '52: Save the Bolls – Produce the Bales

■ THE FARMER fears low prices and is haunted by labor shortages, but he still must grow cotton this year, and grow it profitably. Our job is to convince him that no production practice pays greater returns per dollar invested than the control of cotton insects.

By IVAN J. CAMPBELL
Editor, The Cotton Gin and Oil Mill Press

AT THIS TIME last year farmers were enthusiastically making plans to meet the 16-million-bale goal set for 1951 by USDA. There were threats of equipment and insecticide shortages, of course, and it was a foregone conclusion that the labor supply would be short. But we needed the cotton and farmers promptly responded to the call.

• **The Enthusiasm Is Gone** — But what do we find now, a year later? The production goal is the same and the need for a 16-million-bale crop is just as great. But missing from the picture is the enthusiasm with which the farmer accepted the same challenge last year. To put it in a mild form, the farmer is apathetic about planting a 28-million acre cotton crop in 1952.

Nor are reasons for his apathy hard to find. To start with, the farmer is dead certain in his own mind that the government let him down on last year's crop. As Harold Young of the Cotton Council expressed it, the government took the benefits of the farmer's big production but let its own obligations to the farmer slide.

The farmer knows that if growing conditions are favorable this year, the crop could hit 17 or 18 million bales, or even more, instead of 16 million.

Then too, he knows that growing conditions could be unfavorable, as they were in many places last year, resulting in a short crop. The farmer is worried about prices, too, both for his production and what he will have to pay to make a crop. Doubtless many are thinking, "A big crop could mean low prices and maybe acreage controls in 1953; a short crop could bring on export controls."

The morale of farmers, especially in those areas that had crop failures last year, is anything but high. And adding additional weight to our problem is the prospect of heavier insect populations this year than last.

Even so, in those sections of the Belt where acre yields were high last year, it should not be difficult to keep our expanding program of insect control going at a satisfactory rate.

• **No Simple Problem**—Our biggest job this year is going to be with those growers whose yields were cut to the bone last year by hot, dry weather or reduced by other causes to the point of unprofitable return. Here, ginners and oil millers—and all others who will have a part in the 1952 insect control program—are going to find it difficult to wean growers away from the temptation to hold back on a

program of protecting their crop from the bugs.

At the time he plants his crop the farmer has done just about all that can be done to the land to insure high yields. He can add fertilizer, of course, but the big job of getting the land ready is behind him. The one big remaining step to get his production costs down and his acre yields up is to use insecticides to control pests.

• **What Is a "Cheap" Crop**—After a bad year, or when they fear a drop in prices, many farmers have a tendency to forget all about profitable production practices and aim for a "cheap" crop. That kind of crop is all right—if you define the word "cheap" in the right way. But too many farmers think of "cheap" production in terms of how little they can spend per acre and not in terms of how little it costs to produce a pound of lint.

Year in and year out, a program of insect control based on the recommendations of his own state will make greater returns to the farmer per dollar invested than any other production practice.

If we can drive this fact home to the farmer in 1952 we can look forward to another year in which insect control again plays a major part in profitable cotton production. And the key to profitable production is high acre yields efficiently produced.

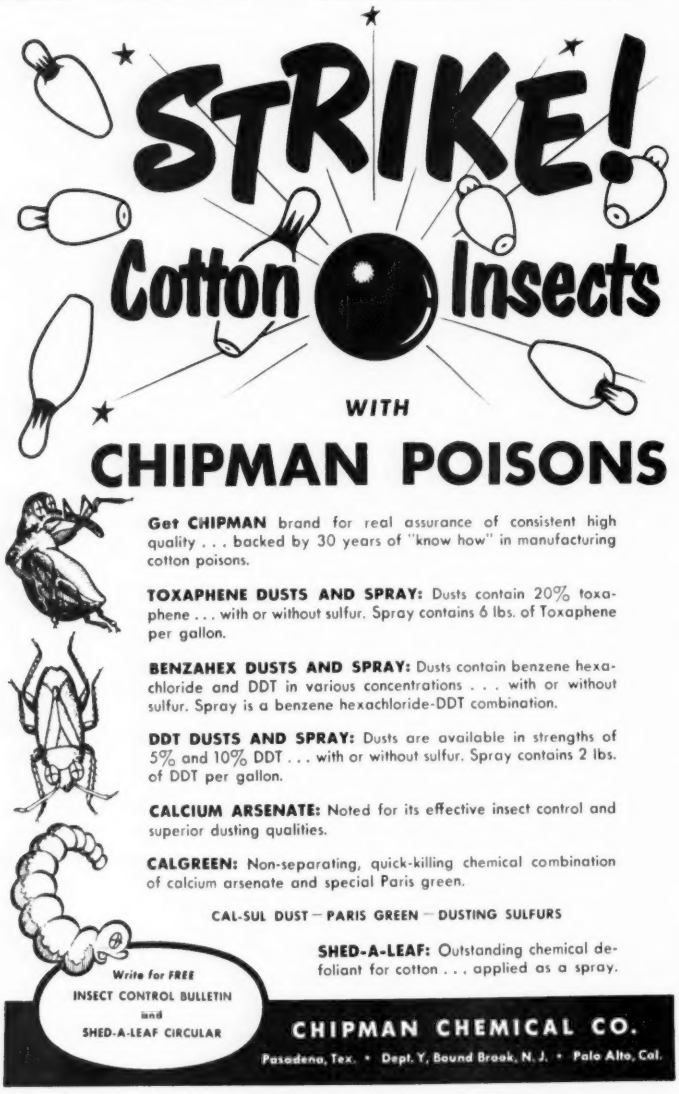
• **The Ginner Can Mean the Difference** — In many of the special articles in this issue great emphasis is placed on the vital job the ginner can do to obtain higher acre yields in his community. In the matter of controlling insects — which normally get one bale in seven—no one has a better opportunity than the ginner to encourage the farmer to adopt this profitable practice and base his program of control on the recommendations prepared by the entomologists in his own state.

In many communities, the ginner can mean the difference between success and failure of the cotton crop this year—or any year.

• **We Have the Materials and Know-How**—Right now it appears that the grower will have the materials to protect his crop from insects in 1952. There is a shortage of sulfur, but it looks like other materials will be in ample supply, and at lower cost, too. Equipment for applying poisons may not be quite as plentiful as we should like, but there ought to be enough to do the job provided insecticides are properly used.

Also, we have the know-how to do an effective, money-making job of controlling pests, but that know-how must be passed on to the farmer. There will be times during the growing season when he has the benefit of advice from competent people about when and how to poison, but for the most part the farmer is going to have to make his own decisions. If he follows his state guide and learns how to recognize harmful and beneficial insects and make counts, he can be reasonably sure of good results.

If you are in an area where farmers made a short crop last year it is going to be necessary to bear down to get a good control program going this year. And even if the farmers in your community should reduce acreage somewhat this year, they can still produce a good crop at a profit if they save the bolls. There is no better way to "save the bolls and produce the bales" than through the use of the insect control recommendations of your own state.



USE aldrin • dieldrin

see no weevil

The monkey sees no weevil (*Anthonomus grandis* Boh.) because he puts blinders over his eyes. The cotton grower will see no weevil if he keeps his eyes open, follows local recommendations, makes frequent field inspections of his crop and uses low dosage Aldrin or Dieldrin formulations when the need is indicated to protect his cotton from boll weevil and such pests as thrips, cutworms, armyworms, grasshoppers, fleahoppers and plant bugs. Bollworm infestation calls for the addition of DDT to the Aldrin or Dieldrin formulation.

Aldrin and/or Dieldrin are officially recommended by the cotton growing states of the South for weevil and other cotton insect control. This is the world's most highly specialized agricultural region where more than 40% of the world's cotton is grown. An insecticide program, properly timed and applied, is one of the most effective means of assuring higher acre yield and greater profits. Aldrin and Dieldrin are the latest and most dependable weapons which science provides for the economical control of cotton pests.

Write today for more complete information. New cotton circulars available upon request.

Julius HYMAN & Company
DENVER, COLORADO

Shell Chemical Corporation, New York City, national distributors of unformulated Aldrin and Dieldrin.

HERE, DEPICTED in a display prepared by George D. Jones, North Carolina Extension entomologist, a farmer is sacrificing most of his cotton crop to the boll weevil. Losses to this insect and other cotton pests cost the farmer, the ginner and the oil miller millions each year.

In '52: Save the Bolls - Produce the Bales

The 1952 State Guides for Controlling Cotton Insects

■ THE STATE GUIDES are the key to successful insect control in the states for which they were prepared. Ginners, oil millers and others who work with the farmer can contribute to higher acre yields by encouraging him to follow the recommendations for his own state. These recommendations are sound and practical, and are tailored to fit the varying conditions of the individual states. If they are followed intelligently, the farmer can expect higher acre yields and increased profits.

1952 Cotton Insect Control Recommendations for:

Alabama

The effective control of cotton insects will always be a major problem in the production of high yields per acre of cotton in most parts of Alabama. At the present time the indications are that the number of cotton insects that will appear in 1952 will be about normal. There is no indication that weevils will appear in any such numbers as was found in 1949 and 1950. However, all farmers are advised to purchase early 30 to 50 pounds of poison for each acre of cotton that will be grown in 1952. This is a good practice for farmers to follow every year.

Poisons to Use

The kind of poison used for the control of cotton insects is not too important. Any of the materials listed here will give satisfactory control if used properly. Important things to remember are (1) Do not treat cotton for insect control until insects are present in large enough numbers to damage stand or crop. In Alabama preventative measures have not resulted in an increase in yield per acre. (2) Apply poison every 3-5 days when needed. Weekly applications will not control boll weevil or bollworm. (3) Apply right amount (10-15 pounds) poison per acre. (4) Try to get poison on when the weather is good but don't let rainy weather stop poisoning. Do not try to dust cotton in the middle of the day. If poison is applied late in the afternoon, it usually will not be washed off before the next day.

These materials are recommended for the control of all major cotton pests, except spider mites.

1. A 3-5 mixture of BHC-DDT.

2. Alternate applications of calcium arsenate and a 3-5 mixture of BHC-DDT.

3. Alternate applications of calcium arsenate and calcium arsenate that contains 2 per cent nicotine.

4. 20 per cent toxaphene.

These mixtures will control all major

FLAT FAN OR CONE NOZZLE?

***Sprajet* CONE NOZZLES**—designed for spraying insecticides on cotton and other row crops. *Sprajet* Cone Nozzles deliver a misty cone-shaped spray. The "boiling action" of this spray pattern envelopes your plant. You can use one, two, or three cone nozzles per row, depending on the size of the crop. Your dealer has *Sprajet* Cone Tips available to fit your present nozzles. And he has them in all standard sizes, too, so you can control the amount of application per acre. Tip orifices on *Sprajet* Cone Nozzles are recessed for protection.

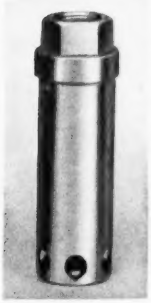
***Sprajet* FLAT FAN NOZZLES**—cover a wide area with a fan-like spray. Actual field tests prove how effective this spray pattern is in chemical weed control. As with all *Sprajets*, the Flat Fan Tip will fit any nozzle body. You need only one set of nozzles. But you can get both bug control and weed control with these nozzles if you have two sets of *Sprajet* tips—Cone and Flat Fan. Your dealer has both these tips in a variety of sizes. This selection makes it possible for you to regulate your spraying to the speed and pressure you want.

DIRT CAN'T CLOG *Sprajet* TIPS
The reason that no clogging dirt particles can reach a *Sprajet* tip is because the screen is always locked to the tip! This gives you the same protection while you are cleaning the screen as when spraying. "Screens locked-in means dirt locked out."

***Sprajet* HAS ONE — NOT TWO SEALING SURFACES**
Because of *Sprajet* one-piece threaded tip assembly, there is only one—not two sealing surfaces. This reduces the possibility of nozzle leaks by 50%.

ARE YOU MISSING YOUR COTTON?

Are your nozzles plugging up in the middle of the field? Do your nozzles sputter? Are you missing rows and having to respray your field? These troubles point to faulty straining! You can stop them by modernizing your rig with a *Sprajet* Progressize Straining System! Screen out all particles that are too large to pass through your *Sprajet* nozzle tips! See details below.



SUCTION STRAINERS. Your first step in installing a *Sprajet* Progressive Straining System is to attach a *Sprajet* Suction Strainer to the end of the hose that goes into the tank. This will keep the sediment in the barrel from entering the system. They are made of heavy brass which fully protects the rust-resistant screens. They come equipped with ½" and ¾" female pipe or ¾" female hose fittings. Models with 12, 18, or 25 square inches of straining area with screens of 50, 100, or 200 mesh. See table below for the proper size suction strainer screen.

LINE STRAINERS. The second step in installing your *Sprajet* Progressive Straining System is to attach a *Sprajet* Line Strainer between the pump and the boom. This strainer catches the smaller foreign particles before they get to your nozzles. Made of heavy brass to withstand high pressures and corrosion. They are equipped with ½" or ¾" female pipe fittings with 12.5 or 21.7 square inches of straining area. Screens of 50, 100, or 200 mesh. See table below for the proper size line strainer screen.

***Sprajet* PROGRESSIVE STRAINING** gives you two large screening areas that progressively screen out foreign particles before they clog your nozzle screens. You'll find the efficiency of progressive straining is worth many times the few dollars that *Sprajet* Strainers cost.

For information on the number of gallons each tip will spray at various tractor speeds and pressures, write for our free *Sprajet* Flo-Guide.

Nozzle Tip Size	Nozzle Screen	Line Strainer Screen	Suction Strainer Screen
1G	200 Mesh	200 Mesh	100 Mesh
2G, 3G, 4G	100 Mesh	100 Mesh	50 Mesh

ACCESSORIES MANUFACTURING CO.
709 McG... Kansas City, Missouri
Cone Nozzles • Flat Fan Nozzles • Line Strainers • Suction Strainers
Double and Single Swivel Nozzles • Double and Single Swivel Nozzle Adapters • Thirsted Check Valves • Venturi Check Valves • Vented Positive Anderson Hand Valves

pests of cotton except aphids and spider mites:

1. Aldrin-DDT, 2.5-5 per cent.
2. Dieldrin-DDT, 1.5-5 per cent.
3. Heptachlor DDT, 2.5-5 per cent.

Bollworms and cutworms can be controlled with 10 per cent DDT or 20 per cent toxaphene. Apply when needed at the rate of 15 to 20 pounds per acre.

Spider mites may appear in dry years in numbers sufficient to damage cotton. These materials are recommended for the control of spider mites:

1. Parathion one per cent.
2. Aramite 3 per cent.
3. EPN 1.5 per cent.

These materials can be used safely, only, by taking every precaution listed on the container.

The supply of sulphur is critical. Do not buy cotton poisons that contain sulphur.

When to Poison

Dust or spray cotton when insects are present in large enough numbers to damage the stand or reduce yields.

Begin fighting boll weevils when cotton plants are fruiting freely and 25 per cent of the squares are punctured. Dust or spray every 5 days until three applications have been put on. After the third application, check each field every week. When 25 per cent or more of the squares are punctured, put on three more applications 5 days apart. If poison is washed off within 1 to 18 hours, repeat application as soon as possible.

When swarming weevils are found in blooms near the top of the stalk, apply poison every 4 days until top bolls are about grown.

How to Apply Poison

You can apply cotton poisons as a dust or as a spray. Dust can be put on with hand, mule-drawn, tractor or airplane equipment. Spray can be applied by tractor or airplane.

Dust when the air is still and cotton plants are dry. Late in the afternoon is usually the best time to apply poison.

Dust formulations other than calcium arsenate are used at the rate of 10 to 15 pounds per acre. Apply calcium arsenate at the rate of 7 to 10 pounds per acre.

The amount of diluted spray used to cover an acre may vary from 2 to 10 gallons.

Sprays that will control all major cotton pests except spider mites when applied at these rates technical materials per acre are:

1. Gamma BHC 0.3 to 0.45 pound plus about 0.50 pound DDT.
2. Toxaphene 2 to 3 pounds.
3. Toxaphene 2 to 3 pounds plus about 1 pound DDT.

Sprays that will control all major cotton pests, except aphids and spider mites when applied at the following rates technical material per acre include:

1. Aldrin 0.25 to 0.40 pound plus about 0.50 pound DDT.
2. Dieldrin 0.15 to 0.25 pound plus about 0.50 pound DDT.
3. Heptachlor 0.25 to 0.50 pound plus about 0.50 pound DDT.

1952 Cotton Insect Control Recommendations for:

Arizona

Practice Good Farming

Always prepare a good seed bed.

Plant as early as possible.

Follow recommended irrigation practices.

Set up a plan for adequate insect control.

Control of insects of cotton by new insecticides has proved to be very important. This is reflected by increased yields and better quality of cotton.

The control of insects alone will not give the high yield or good quality. Neither will following good farming practices. It takes a combination of good farming practices and insect control to give the desired results.

Learn to recognize the injurious cotton insects and use a bug net (16-inch diameter) at several points in the field to determine if insects are present in harmful numbers. When you are sweeping for the injurious insects, you may also catch many beneficial insects. Learn to know these beneficial insects. Most of them are predators. You may catch the big eye bug, the aphis lion, the orius, nabids and assassin bugs that feed on lygus, stink bugs and rapid plant bugs as well as eggs and small worms of the cotton bollworm and other worms. You may also catch the lady bird beetle in both larval and adult stages that feed on aphids and thrips. Nearly all of the insects feed on aphids. There are other beneficial insects that we may show in field demonstrations.

Start control applications when six to eight sucking insects are found in the bug net after making 100 sweepings over the tops of the cotton plant. These counts should be the average of at least 5 wide sweepings in a field. Start control of chewing insects, principally bollworms, when they start appearing in the growing tips of the cotton plant. The eggs are laid on the tender growing tip and the egg hatches a very small worm that eats its egg before feeding on the plant. Look for these worms on 25 or 50 plants. If you find 2 to 4 worms in these counts, at several points in the field, start dusting or spraying.

Do not dust or spray as a preventative measure or just because your neighbor dusts or sprays. Endeavor to apply insecticides when weather conditions are favorable. Tall, rank cotton may require heavier applications than are recommended.

Control These Insects

Below are the injurious cotton insects of Arizona and controls based on research conducted by Mr. W. A. Stevenson and workers of the Bureau of Entomology and Plant Quarantine, Division of Cotton Insects.

Chewing Insects

• **Beet Armyworm**—The beet armyworm may be the first insect to harm your cotton. It feeds on the cotton plant when it is in the seedling stage, and in some instances may partially destroy the crop. It is not injurious every year, as parasites usually keep it under control. Some seasons late infestations injure the forms.

A dust mixture of 5% DDT and a high percentage of 325 mesh conditioned sulphur will give good control when applied at the rate of 15 pounds per acre. If a spray is used, be certain to apply ¾ of a pound of technical DDT per acre. One pound of toxaphene per acre in sulphur dust or spray may be an alternate material to use.

• **Darkling Beetle**—This is a minor pest. However, some seasons it may be very injurious, especially following alfalfa or in sandy soils. Control for this insect is poison baits, dusts or irrigation for long periods after sprouting time.

Ten percent DDT and a high percentage of 325 mesh conditioned dusting sulphur mixture applied at the rate of 15 pounds per an acre by ground machinery gives good control. An alternate material may be an apple-peel bait applied at the rate of 10 pounds per acre between the rows. (Apple-peel bait is dried apple peel impregnated with sodium fluosilicate.)

Sucking Insects

• **Lygus Bugs, Stink Bugs, Superb Plant Bugs, and Cotton Fleahoppers** — These are the most important sucking insects of cotton. They feed on squares or bolls of the cotton plant. The stink bugs cause more injury to cotton bolls and stain the lint.

Ten percent DDT and a high percentage of 325 mesh conditioned dusting sulphur applied at the rate of 15 pounds per acre, controls all of the sucking and chewing insects, except the stink bug, spider mites and salt marsh caterpillars. Research work shows also that 20 percent toxaphene and a high percentage of 325 mesh conditioned sulphur is effective when applied at the rate of 15 pounds per acre per application.

Sprays are equally as effective as dust. Be certain the same amount of technical material is used per acre. Do not use more than 4 gallons of material per application. Extremely rank cotton may require a higher gallonage per acre.

A 5 percent DDT 2 percent gamma isomer benzene hexachloride and a high percentage of 325 mesh conditioned sulphur will give best control of stink bugs when applied at the rate of 15 pounds per application. If a spray is used, be certain to apply not less than four-tenths of a pound of gamma isomer benzene hexachloride per acre.

An alternate dust may be 5 percent DDT, 15 percent toxaphene and a high percentage 325 mesh conditioned sulphur applied at the rate of 15 pounds per acre. If liquids are used, an alternate may be 2 pounds toxaphene, 1 pound DDT emulsion in 4 gallons of water per acre.

Injury by superb plant bug is primarily found in Safford Valley.

• **Thrips**—Thrips may and do cause serious injury to young seedling cotton plants. Not all fields are infested but when they are present they can cause serious injury to the plants. In 1951, Mr. Stevenson and workers of the Bureau of Entomology and Plant Quarantine found a profitable increase of

Quotes From Our Authors:

"WE MUST KNOW whether a pest killer is needed, what chemical material is best, that it is properly prepared, that it is put on the right time, in the right amount, and especially in the right way."

seed cotton per acre where an application of 10 percent toxaphene dust was applied at the rate of 100 pounds per acre with a ground duster. The dust was applied when the cotton plant was in the 4 to 6 leaf stage of growth.

A spray mixed so as to deposit 1 pound of technical toxaphene or ½ pound of DDT per acre is also effective. A 5% DDT dust applied at the rate of 10 pounds per acre has also given good results.

Control measures should be started when thrips can be found on the small plants and the leaves are curling. Thrips not only retard plant growth, but blast very small squares.

• **Aphids or Cotton Lice (Sucking Insect)**—Aphids sometimes cause serious injury to cotton in all stages of growth. The worst injury is caused by their presence on plants when cotton bolls are open. The "honey-dew" that they excrete injures the quality of the lint.

Benzene hexachloride at the rate of one-half pound of the gamma isomer per acre gives a "knockout" of the aphids. One-percent parathion dust applied at 15 pounds per acre is also effective.

Follow directions when using.

• **Bollworm (Chewing Insect)**—The bollworm feeds on both squares and bolls of the cotton plant. The bollworm must be controlled when it first appears in the tops of the cotton plant. Use a 10 percent DDT and a high percentage of 325 mesh conditioned sulphur at the rate of 15 pounds per acre per application. An alternate dust of 20 per cent toxaphene and a high percentage of 325 mesh conditioned sulphur will give control at a slower rate when applied at 15 pounds per acre per application. Sprays may be used if the same amount of technical DDT or toxaphene per acre are used as with dust. The sprays must be applied at the correct time or when the worms first hatch or very poor results will be secured.

• **Cotton Leaf Perforator (Chewing Insect)**—This insect caused the greatest injury to stub cotton. However, it may become injurious to planted cotton. Due to its habits of feeding only short periods, it is difficult to control. A 10 percent DDT and a 325 mesh conditioned sulphur will give good results when applied at 15 pounds per acre.

• **Spider Mites**—Several species of spider mites may appear in cotton fields in great numbers during 1952. In most cases, an application of 30 to 40 pounds of 325 mesh conditioned sulphur should give good control. There may be some species that show a resistance to sulphur. Several other materials including aramite, parathion as well as others have shown promise. Any new recommendations will appear in the weekly cotton insect report during the summer of 1952.

• **Salt Marsh Caterpillar** — The salt marsh caterpillar, also known as the woolly worm, may cause some injury to cotton. All stages of this worm may be controlled with a dust mixture of 5 percent DDT, 15 percent toxaphene, and a high percentage of 325 mesh conditioned sulphur. Apply at the rate of 20 to 25 pounds per acre per application.

A mixture of 1 pound of technical DDT and 3 pounds of technical toxaphene in an emulsion form is effective as a spray for control of this insect.

Suggestions

Experimental work indicates a dust mixture of 5 percent DDT 2 percent gamma isomer benzene hexachloride and 50 percent 325 mesh conditioned sulphur to be the best materials for control of stink bugs. Apply this material at approximately 15 pounds per acre per application.

The above material also will kill aphids if they are present. **In fact, this dust mixture will give control of all the insects that infest the cotton fields except the salt marsh caterpillar and spider mites.** For alternate materials see the paragraph on lygus control.

If salt marsh caterpillars should appear in August, be sure that you control them with the recommended insecticides at once.

There are many types of ground spray equipment for sale. Be sure to secure one that gives a good coverage of the plant at all times and gives 60 pounds of pressure or more.

Hints on Airplane Applications of Insecticides

Farmers: Control of insects is big business. Why not treat it in that manner.

You are paying the crop duster to dust or spray your crop, so why not see that it is done correctly.

Before dusting or spraying, see if it may bother livestock, livestock crops and bees and if so, attempt to remedy the situation.

1. Furnish competent flagmen in the field.
2. Furnish one person at the airplane loading field.
3. Have prearranged signals with airplane and ground crew and flag the airplane out if the insecticide is not being applied correctly and on correct fields.

Airplane Applicators: Your job is to apply insecticides under best weather conditions. Know the hazards of the insecticides you are applying. Remember you are working for the farmer, the insecticide is his, the crop is his, so apply under direction and not the way you desire.

1. Have one man to assist the farmer's worker at loading field.
2. Be sure to know the location of the field and the insecticide you are to apply.
3. Always follow the flagman. Have prearranged signals and if he flags to stop dusting or spraying, follow his request. He is paying for the service you are rendering.
4. Do not make swaths wider than

(Continued on Page 24)

Quotes From Our Authors:

"IN THE four-year period prior to the 1951-52 season, cotton insect damage, according to National Cotton Council estimates, averaged over two and a half million bales annually."

EARLY STALK DESTRUCTION is one of our most effective insect control measures. It prevents reproduction, destroys insect food, and feeds the land.

THE GINNER'S STAKE in cotton insect control is just as great as the farmer's. Profitable gin operation often hinges on how well the farmers in a community hold insect pests in check.

In '52: Save the Bolls - Produce the Bales

The Ginner's Influence In Insect Control

By CLAUDE L. WELCH

■ NO ONE has a greater opportunity than the ginner to sell the value of insect control to the farmer and encourage him to follow the recommendations of his state entomologists.

HOW MUCH WOULD an increase of 170 to 200 pounds of lint cotton per acre mean to you as a ginner in your community? How much would it mean to your county and to your state? What would it mean to the Cotton Belt?

At 1951 prices that much additional cotton would mean from $70 to $90 per acre added to the gross income of the cotton producer. In a county producing 20,000 acres of cotton, such an increase would mean 6,800 more bales going to the gin and 2,400 more tons of seed to be processed and marketed. Gross farm income would be increased $1,360,000 for lint and $173,000 for seed.

These figures are not mere phantasy. They simply state in terms of dollars and cents the possibilities of effective cotton insect control. That increases in yield of from 170 to 200 pounds of lint cotton can be gained by sound cotton pest control has been proven by state experiment stations, as well as cotton growers, in a number of Cotton Belt areas in years such as 1949 and 1950.

CLAUDE L. WELCH is Director, Division of Production and Marketing, National Cotton Council, Memphis.

Proof that such gains can be realized, when contrasted with the enormous losses inflicted by cotton pests year after year across the Cotton Belt, provides an irrefutable argument for a concentrated program of control reaching into every community and to every farm where insects are a threat. Leadership in such an effort offers the ginner an opportunity for the highest type of community service, one which not only will result in the deep satisfaction of having helped his fellow man but in greater volume of bales at the gin shed.

If you already are participating in such a program, as are many ginners and agricultural leaders across the Belt, you are doing much more than protecting your investment by helping bring more cotton to your plant. You are helping the farmer to grow cotton more efficiently, aiding him to attain a higher net profit and more income, thus enabling him to enjoy a higher standard of living. You are helping him to pay off a loan at the bank. You are helping him pay for additional equipment. In the final analysis you are helping your community attain a higher level of economic activity.

Control of cotton insects on the individual cotton farm, united into an all-out effort at the community level, is the very core of any program which seeks to reduce pest losses on a large scale, whether it be countywide, statewide or Beltwide. The ginner is one of the most powerful forces which could be marshaled in such a fight, for he is one of the farmer's closest friends.

In pressing for an integrated effort to reduce cotton insect losses across the Cotton Belt, the National Cotton Council and the state and federal agencies dedicated to the task, fully recognize its enormity. The stakes involved, however, are of such magnitude they are difficult to visualize.

Fore more than half a century the boll weevil has stalked across the Cotton Belt, leaving devastation in his wake, impoverishing our farmers, bankrupting financial institutions and the entire communities. The ruin wrought by this pest, as well as the bollworm, pink bollworm, fleahopper and other cotton robbers, has been evidenced by the despair in the face of the farmer.

It would be difficult indeed to translate into terms of dollars the toll in cotton and seed exacted by cotton pests during the period in which cotton has been grown in this country. Estimates of this damage over the past four years are merely indicative of what has been happening in our Cotton Belt for a long time. In the four-year period prior to the 1951-52 season, cotton insect damage, according to National Cotton Council estimates, averaged over two and a half million bales annually. Dollar value of cotton and cottonseed kept out of production by pests in 1950 set an all-time record, totaling $907,884,000. This topped the record of $617,874,000 in the 1949 season and by far exceeded the $202,264,000 of 1948, and the $269,384,000 of 1947.

The tremendous losses each year provide a constant reminder that we still have a long way to go in our cotton insect control programs. They emphasize dramatically the dollars that are never being banked as these predators of cotton rob us of our income. More important, however, and on the positive side, are the gains which are being realized increasingly by our cotton farmers as they adopt systematic and concentrated programs to control pests.

In 1950, the year in which pest damage set an all-time record, the Mississippi Agricultural Extension Service estimates

PROVEN QUALITY

MISSION BRAND

COTTON POISONS

TOXAPHENE dusts and sprays
DDT dusts and sprays
TEPP spray
ALDRIN dusts and sprays
CONCENTRATES

PARATHION dusts and sprays
BHC dusts and sprays
CHLORDANE dusts and sprays
DIELDRIN dusts and sprays
SULPHUR dusts

The above are manufactured in all approved combinations
Order ... MISSION BRAND Cotton Dusts and Liquid Cotton Sprays of proven quality

Write for Our Price List and Availability Sheet

HAYES-SAMMONS CHEMICAL CO.

MISSION, TEXAS, U.S.A.

IN MEXICO

HAYES-SAMMONS, S.A. REYNOSA, TAMPS., MEXICO

that farmers gained an added $93 million by poisoning wisely.

In South Carolina, for several years, cotton industry organizations, the Extension Service, and other groups have carried on a concentrated insect control campaign reaching into every cotton producing community in the state. Civic clubs, local newspapers and radio stations, and public-spirited individuals united in emphasizing the importance of pest control not only to the farmers but to the economy of the entire community. The fight is carried on at a community level in some cotton producing areas of Texas. Other states, where cotton insects are a threat, more and more are heeding the call of their entomologists and uniting their efforts to lessen the staggering levy laid each year by the boll weevil, pink bollworm, leafworm and other cotton insects.

That such activity is paying off is apparent in the vast increase in the use of insecticies. In 1951 more than 600 million pounds of death dealing poison was applied to the crop, setting a new record. Farmers applied a total of 500 million pounds in 1950, and about 200 million pounds during the 1949 season.

Researchers in private industry and in our state and federal agencies are working constantly to improve and develop better materials for killing cotton pests. A great deal of time, study and money is being spent to provide the cotton farmer with better equipment with which to apply these pesticides. As a result, with the insecticides, machines, and techniques available today, it is possible to control effectively all the major pests which attack cotton.

As was pointed out by one of the scientists at the fifth annual Cotton Insect Control Conference in Memphis in December, despite all our progress, the problems before us in cotton insect control research are vast. There is much to be learned about insects basically—what makes them tick. This speaker voiced a need for better understanding of the physiology of insects, including the specific reaction of all the chemical changes taking place in the body of living insects, noting that this would probably lead to development of more and less hazardous insecticides.

We have no doubt that continuing study will be given to the problems this entomologist presented, and that the results will someday be seen in a fatter pocketbook for the cotton farmer. There is an immediate and urgent need, however, for putting into fullest use the materials, knowledge and techniques which our scientists already have made available. To get this knowledge into the cotton field, our agricultural agencies already are exerting every effort, but the task is one of such magnitude that it can be achieved only with the help of everyone who is interested in the welfare of cotton.

The cotton farmer not only must be sold on the value of cotton insect control in bringing him added profits, but also must be thoroughly indoctrinated in the use of recommended practices. Mere purchase of insecticides is not enough. If they are applied improperly and ineffectively with the result that the cotton grower's investment is wasted, that farmer loses faith in cotton insect control and the community program is jeopardized seriously. Twelve poisonings, applied each Monday, for example, throughout the season, without regard to infestation, weather conditions, wind velocity, drift, plant coverage, and other important factors, might be totally ineffective. On the other hand, a half dozen applications, at the right time, rate, and interval between poisoning, etc., might provide adequate protection.

We have said that the cotton ginner might well be one of the key figures around which the entire community control program could be built. Ginners are in a position to perform two of the most essential jobs on which the entire educational activity hinges—first, convincing the individual farmer of the value of insect control and, second, encouraging producers to follow systematically the cotton pest control recommendations of their state entomologists.

There is an urgent necessity for such work now as we move into the 1952 season. Concentrated individual effort right at this time can supplement and make much more effective the activity of our agricultural educational agencies who are moving out on their insect control programs for the year ahead of us.

None of us know what lies in the season just before us, but it would be well to take a quick look at some of its possibilities.

Although infestation of cotton insects was fairly light in most parts of the Cotton Belt during the early part of the 1951 season, there was somewhat of an alarming build-up during the latter part of the season.

Late rains in some areas stimulated growth of the cotton plant and resulted in heavy infestations of weevils and other pests. It is true that the early freeze in the fall of 1951 killed a great number of these cotton insects, but it must be remembered further that large numbers went into hibernation in fairly good condition. Such a situation could very easily result in a high survival rate this spring. In areas where the winter has been comparatively mild it is reasonable to expect that the mortality rate of cotton pests will be low.

It should be borne in mind that an early, warm spring, with a few rains during a critical stage, could be inducive to heavy insect build-up which could upset the schedule of an effective control program. All these are possibilities which the cotton producer should face squarely in planning his 1952 cotton crop.

If the rate of infestation does not vary too much from normal, and if farmers place their orders for insecticides early and thus make the job of distribution easier, supplies of poison should be adequate to protect the 1952 crop. Two possible difficulties in the supply picture are a shortage of dusting sulphur and of metal containers. A nationwide campaign is being instituted for conservation of sulphur. Furthermore, many entomologists across the Belt have agreed to substitute other miticides for sulphur in their recommendations. The National Production Authority has agreed to authorize expansion in production of these substitutes. Success of this plan would assure sufficient supplies of miticides to meet 1952 demand.

The trend away from dusts to concentrated emulsions is causing an increased tension in supply of steel containers for insecticides. With use of more poison indicated in 1952 the demand for containers should be proportionally greater than last season.

Although at the present time the outlook for insecticides is encouraging, there is little excuse for waste of insecticides. In the first place, the basic chemicals which are used in manufacturing poisons for insects, also have strong demand in the mobilization effort. Secondly, with production costs rising continually, the cotton farmer can ill afford to spend money on materials which are not used in such a manner that they give him full value for his dollar.

To realize the full value of insecticides in an effective insect control program and to attain more efficient cotton production, farmers might well make use of these hints: (1) recognize cotton pests and the damage they are capable of inflicting; (2) know which insecticides to use and apply them as recommended by competent authorities; (3) keep equipment adjusted properly and in good working order; (4) have materials on hand for immediate use and be prepared to fight insects at all times; (5) order early to facilitate insecticide production and distribution; (6) make insect counts in your field; (7) consult your local agricultural agent frequently.

As a community leader, business man, and in many cases as a farmer, the cotton ginner is one of the most powerful influences toward agricultural betterment in the area in which he lives. As this force is united and joined more fully against the common foe of pests which have robbed our cotton farmers disastrously for six decades, the victory will loom nearer. Great prosperity and a fuller life for our cotton industry will be the reward.

State Guides

(Continued from Page 21)

power of plane will give. Usually a swath by a 450 HP motored plane should not be over 50 feet in width.

In many areas the farmer and applicators sign contracts. Remember this is a business proposition so why not follow these procedures.

1952 Cotton Insect Control Recommendations for:

Arkansas

BOLL WEEVIL

Arkansas farmers demonstrated during the heavy outbreaks of 1949 and 1950 that the boll weevil can be controlled by applying insecticides at the **right time** and in the **right place.** They used a variety of effective insecticides.

Correct timing and placing of applications require:

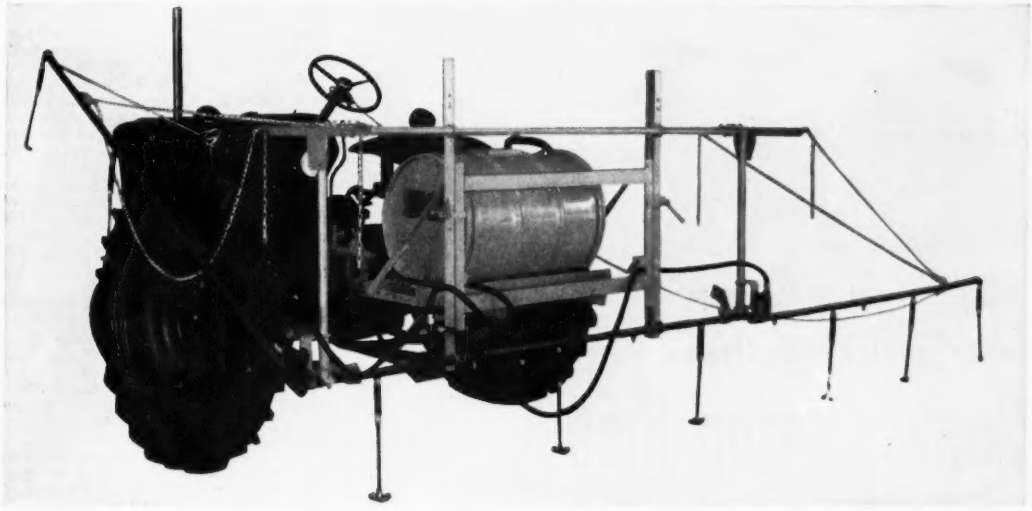
1. Ability to recognize punctured squares.
2. Ability to recognize stages of the boll weevil (weevil, egg, grub, and pupa).
3. Knowledge of habits of the boll weevil.
4. Knowledge of duration of the life cycle.

Development of Weevil

The boll weevil is a grayish-brown snout beetle about ¾ inch long. It feeds on squares and small bolls. Insecticides

(Continued on Page 28)

Make sure your Cotton Crop *Pays Off*



Growers report better all-around protection with

IRON AGE COTTON SPRAYERS

RUGGED, dependable Iron Age Cotton Sprayers assure you complete protection, maximum coverage, and lower spraying costs, year after year. That's why growers everywhere say, "Spray the Iron Age Way!"

Check these features of the Iron Age Cotton Sprayer: Bronze gear pump, driven from power take-off. Pressure regulating valve for maximum protection. 50-gallon tank with mounting parts for quick, easy assembly!

Booms are rear mounted, with your choice of 6 to 8 row coverage, with nozzle arrangements for 3 to 5 nozzles per row. 36″, 38″, 40″, or 42″ row spacing. Universal spacing—34″ to 42″—can be quickly secured by adding hose and clamp assemblies.

The Iron Age Cotton Sprayer mounts on all popular row crop tractors, with special kits available for Ford, Ford-Ferguson, and Ferguson tractors. When ordering, specify tractor make and model.

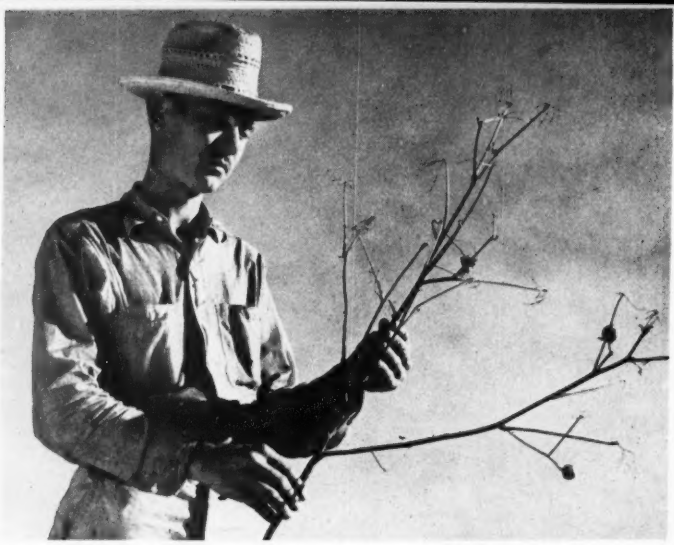
Whatever your acreage, it will pay you to investigate Iron Age Cotton Sprayers. Learn how they can give you better protection at less cost!

For more information, write: **A. B. FARQUHAR CO., *Farm Equipment Div.*, 3003 Duke St., York, Pa. *Branches in* Columbus, Ga., Palo Alto, Calif., and Dallas, Texas.**

A. B. FARQUHAR COMPANY, Division of THE OLIVER CORPORATION

PLANT AND SPRAY THE IRON AGE WAY

Farquhar
IRON AGE
YORK, PA.
POTATO AND VEGETABLE PLANTERS · TRANSPLANTERS
SPRAYERS · DUSTERS · POTATO DIGGERS · WEEDERS
MANURE SPREADERS · CONVEYORS · JUICE PRESSES



IT COSTS JUST AS MUCH to produce a barren plant as one that's well fruited. The cotton leafworm got this one.

In '52: Save the Bolls - Produce the Bales

Some Cotton Insect Problems We Face

By AVERY S. HOYT

■ ONE OF THE greatest of these problems is the pink bollworm, an extremely dangerous pest that has succeeded in breaking the bonds which have held it in check for many years.

COTTON FARMERS in 1951 used more insecticides and did a better job of controlling insects than ever before. Yet, 1951 witnessed a strong upsurge of the pink bollworm, most serious of all cotton pests, and cotton farmers failed to reach the 16 million bale goal set by the United States' Secretary of Agriculture, by just about the amount the insects took.

Entomologists believe control of the pink bollworm is among the most serious of cotton insect problems facing this nation today. This insect, until recently controlled rather well in limited areas of the Southwest through enforcement of rigid quarantines and control measures, moved last year into considerable new territory in Texas and Oklahoma. It spread into additional territory in 1950 under favorable conditions, with large numbers surviving the 1950-51 winter.

AVERY S. HOYT is Chief, Bureau of Entomology and Plant Quarantine, U.S. Department of Agriculture, Washington.

Then, heavy rains in August and September flooded thousands of acres in south Texas, preventing growers from getting old cotton plants cut and plowed under. This enabled the pests to spread northward. Many pink bollworms developed last fall on thousands of acres. Surveys made in January indicate that large numbers are surviving the winter.

Today we can meet this new pink bollworm threat with DDT, a highly effective insecticide. The trend toward earlier picking—through use of defoliants and machine-harvesters, allows more cotton farmers to follow the pickers and strippers with mechanical shredders and plows. Such methods reduce the chances of pink bollworm survival.

So far, the situation is serious but not hopeless. The pest has advanced before and was brought under control. In 1950 they were found in five Louisiana parishes—and apparently eradicated without benefit of our best present-day control methods. If the pink bollworm spreads over the entire Cotton Belt, the United States will be the only major cotton producing area in the world faced with two major insect problems, the boll weevil, and the pink bollworm.

This problem is one that demands the highest degree of cooperation between farmers, entomologists, regulatory officials, and industry, if we are to prevent the pink bollworm from reaching its greatest destructive potential in the United States.

The impressive thing about insects is that the story is never the same for any two years. The number and kinds of insects change as weather conditions vary, as the numbers of natural predators and parasites increase, as the uses of effective insecticides and control measures ebb and flow. One thing is certain: there is need for insect control every year.

The cotton farmer who faces this fact and includes insect control in his regular farming routine will be rewarded with increased yields of a higher quality product.

Planned insect control is based on a knowledge of actual conditions in a cotton field. An over-all picture of prospective insect pest conditions is provided by general surveys conducted cooperatively by federal and state entomologists, but the farmer himself must learn to interpret reports of these surveys by reading signs of insect build-up in his own cotton fields. The farmer's inspection of his field tells him what insects must be controlled and when the job must be done.

The past year found cotton farmers, county agents, and entomologists keeping a close check on the development of thrips and cutworms in cotton fields. This attention apparently paid off in early control of these insects, with generally good results. On the other hand, considerable insecticidal spray and dust was probably wasted in 1951 because it was applied without knowing what damaging insects were present, or if they were present in sufficient numbers to justify the use of insecticides. Control at the right time can often mean doing the job with a minimum of time, labor and insecticide.

The sprayer or duster must take its place as a regular piece of farming equipment. The trend to spraying is showing up strongly, because sprays can be applied during normal working hours, with less regard for most wind and rain problems that might trouble a farmer using dusts. The modern sprayer is lightweight, tractor-mounted equipment that usually can be used in conjunction with other cultivation machinery.

The stalk shredder, too, appears to have a place on many farms. These shredders cut the cotton stalks into small pieces and can be an important factor in holding down the number of boll weevils and pink bollworms that enter hi-

Our manufacturing facilities are specifically designed and engineered to produce agricultural dusts and sprays.

Intimate Blending
Air-classified

* Correct Particle size
* No lumping
* Free flowing
* Even uniform distribution
* Uniform insect kill

Engineered closed system
Emulsifiable plant

* Selected solvents and emulsifiers
* Stability
* Emulsifies readily
* Uniform insect kill

Our large production capacity of quality materials is geared to supply your high seasonal demands.

SOUTHWEST FERTILIZER & CHEMICAL CO.

Lubbock, Texas	Pecos, Texas	Clint, Texas	Crystal City, Texas
P. O. Box 693	P. O. Box 107	P. O. Box 33	P. O. Box 97

hibernation in the fall. With defoliants and mechanical picking hastening the harvest of the cotton crop, the shredder gets its job done early, before frost.

Community control of insects deserves deep consideration. Farmers who work together in ridding their community of an insect problem often will find the job easier and the results considerably more successful. The farmer who does an effective control job on his own acres is often faced with a later invasion by the same insect from fields of his neighbor who practices no control.

The need for more and better insect control is clearly understood when it is realized that cotton insects take one-seventh of the total crop away from us in an average year. In this period of national defense, when every bale can be used to forge a stronger free world, it becomes imperative that all of us strive for the best possible control of insects that affect the production of cotton.

State Guides

(Continued from Page 24)

are aimed at killing the adult weevil, since this is the only stage not passed inside a square or boll.

The egg is 1/30 inch long, oval, and pearly white in color. It is laid by the weevil in a square or small boll. A white, legless grub hatches from an egg. It develops entirely within a square or boll destroying the contents. The full-grown grub changes to a white, delicate pupa or resting stage that resembles the adult in form.

The period in the square (egg, grub, pupa) is about 16 days in favorable summer weather. After an adult weevil emerges, it does not lay eggs or migrate to any great extent for seven or eight days. From generation to generation takes about 25 days during summer weather, and longer in cool weather.

Boll weevils like warm, moist summer weather. Under these conditions a small winter carryover may build up to damaging numbers by the end of the season, as it did in 1948. Hot dry weather slowed down a potentially destructive outbreak last summer.

Boll Weevil Punctures

Correct timing and placing of insecticide depends on scouting. This requires ability to recognize the two types of boll weevil punctures, as well as other insects and their damage. The **Feeding Puncture of the Boll Weevil** is a small open hole on a square or boll, usually near the tip. Many such punctures are often found in a single square. Bright yellow castings scattered about indicate feeding. An **Egg Puncture** is usually near the base of a square. Usually, only one egg is laid in a square, after which the hole is closed by packing it full of castings. A blister or swelling that can be easily felt with the finger, is formed where an egg is laid. A few days after a square is punctured, it flares—that is, the bracts spread apart. In a few more days, the square turns yellow and falls off.

Control of Overwintered Weevils

Weevils overwinter in grass, trash, and leaves. They come out of hibernation from March until July. Many weevils die before squares are available. Weevils feed in terminal buds until squares are formed. Damaged plants send out side branches and soon recover.

Weevils can be readily seen in terminals of cotton plants. Insecticides may be applied when squaring begins, if overwintered weevils are numerous. A second application may be made one week later, if weevils are still present. These applications serve to thin out high populations of overwintered weevils, but do not replace control measures later in the season. Applications should usually be confined to large, early cotton and to cotton near favorable hibernation quarters. Treating large areas and making repeated applications encourage outbreaks of bollworm, aphid, and red spider, without corresponding benefits in weevil control.

Trap crops are often useful in concentrating overwintered weevils. A few rows of early cotton may be planted near hibernation quarters to attract weevils emerging from hibernation. Several insecticidal applications may be

(Continued on Page 40)

Boll Weevil Calendar for Arkansas

(Intervals in weeks are approximate and will vary with weather conditions)

When to Act	What the Weevil Does	What Control Measures to Take
Just before the first squares set.	Weevils, if present, are in terminal buds waiting for squares.	Look for adult weevils in terminal buds of cotton plants. Where concentrations of adult weevils are found, dust once or twice.
Two to three weeks after squaring begins.	Overwintered weevils lay eggs in the first squares which then flare (bracts spread apart). The grub pupal stages are passed in them.	Scout for flared squares on the plants, and on the ground to locate infested spots. Mark the infested spots.
Four to six weeks after squaring begins.	First-brood weevils begin to emerge and feed. They should be killed before they begin to migrate and lay eggs.	Look for weevil punctures in each marked spot once a week. Begin spot dusting as soon as newly-punctured squares are found. If infestation is general, begin blanket dusting when justified by infestation count.
One week later.	First-brood weevils begin to migrate short distances and to lay eggs.	Continue scouting at weekly intervals. If new spots are found, dust them. If other general infestations build up, dust them.
Eight to 10 weeks after squaring begins.	Second-brood weevils begin to emerge and feed.	Scout ALL cotton once or twice a week, watching for the general rapid rise in infestation that marks the beginning of emergence of second-brood weevils. Dust as needed.
One week later.	Second-brood weevils begin to lay eggs and to migrate. In weevil years, this is the late summer dispersal with heavy flights daily.	Continue regular scouting of all cotton. Where infestations justify, dust at four-day intervals until crop is safe (with all bolls at least 16 days old).

Rates of Insecticide Applications

In the following tables are given amounts of insecticides per acre. The first figure is the mid-summer applications on medium-sized cotton with moderate weevil infestations. The second figure is for heavy outbreaks on large cotton. To thin out overwintered weevils on small cotton when squaring begins, use half of the first figure.

Dusts

Insecticides	Strength of Dust	Amount Per Acre
Recommended		
Calcium arsenate	Undiluted	7-10 lbs.
Toxaphene	20%	10-15 lbs.
BHC-DDT	3-5-40	10-15 lbs.
Substitute		
Aldrin	2.5-5-40	10-15 lbs.
Heptachlor	(Same as Aldrin)	
Dieldrin	1.5-5-40	10-15 lbs.

Sprays

Insecticides	Strength of Concentrate	Amount Per Acre*
Recommended		
Toxaphene	4 lbs. per gal.	2-3 qts.
	6 lbs. per gal.	2-5 pts.
	8 lbs. per gal.	2-3 pts.
BHC DDT	Enough concentrate to furnish 0.3 to 0.5 lb. gamma BHC and 0.5 to 0.8 lb. DDT per acre	
Substitute		
Aldrin	2 lbs. per gal. aldrin plus 2 lbs. per gal. DDT	1-1½ pts. 2-3 pts.
	1 lb.-2 lbs. mixture of aldrin and DDT	2-3 pts.
Heptachlor	(Same as Aldrin)	
Dieldrin	Enough concentrate to furnish 0.15 to 0.25 lb. dieldrin and at least 0.5 lb. DDT per acre	

*This is the amount of concentrate. Dilute with enough water to spray an acre. From 1 to 10 gallons of water may be used for this.

BOLL WEEVIL TIME

Order Your Stock of COTTON POISONS *Now!*

Get ready early for the season in cotton sprays and dusts. Our country needs a big crop this year. Your customers will want full supplies of poisons for the bugs, worms, thrips and spiders that infest this vital crop.

So order these dependable Thompson-Hayward insecticides **now:**

Phenacide Dust No. 20	Cotton Dust 3-10-40
Phenacide WE-60	Cotton Dust 3-5-0
Cotton Spray 4-2-0	Cotton Dust 3-5-40
Ded-Tox WE-25	Cotton Spray 3-5-0
Cotton Dust 3-4-10	Cotton Dust 20-40

Priced for excellent profit and fast turnover. Get ahead of peak rush. ACT TODAY!

THOMPSON-HAYWARD CHEMICAL COMPANY

KANSAS CITY, MISSOURI • NEW ORLEANS, LOUISIANA
Minneapolis • Oklahoma City • N. Little Rock • San Antonio
Des Moines • Davenport • St. Louis • Houston • Dallas • Wichita
Memphis • Chicago • Omaha • Denver • Tulsa

The 1951 Conference Report

of Cotton Insect Research and Control Memphis, Tennessee, December 2-4

THIS IS THE fifth report to summarize results of conferences of state and federal workers concerned with cotton insect research and control. It reflects current thinking on the subject and presents information that is of great value to all who will have a part in the 1952 control program.

RESEARCH and extension entomologists and associated technical workers from 13 cotton-growing states (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia), the United States Department of Agriculture and the National Cotton Council of America, participated in a conference at the Gayoso Hotel, Memphis, Tenn., on Dec. 2-4, 1951, to formulate a guiding statement for cotton insect control recommendations in 1952 based upon the research and experience of 1951 and previous years. Each section and sentence in this report was carefully considered and unanimously approved by all members of the Conference. Cultural methods and the use of insecticides for controlling cotton pests are considered in this report.

Cultural control practices cannot be too strongly emphasized. It should be recognized that control of cotton insects by the use of insecticides is really supplemental to the adoption of good farm practices. Cultural control methods include such factors as early fall cleanup before frost where possible on farms where the boll weevil or pink bollworm occur, seed treatment, early planting, fertilization, use of proper cotton varieties, proper land use, and cultivation. Cultural measures used in cotton insect control depend upon which insects are to be controlled and are influenced by climate, soil conditions, fertility, topography, and geographical location.

In addition to recommendations for the use of certain insecticides for control of cotton insects, this report presents information believed to be of value (1) to industry in planning production programs and (2) to state and federal workers who cooperate with cotton growers in testing insecticides still in an experimental stage. It contains some suggestions as to research needs in developing more effective cotton insect control programs. A general statement of plans is included by which extension entomologists will aid in bringing to the attention of growers and all interested groups the 1952 insect control recommendations for each state. Control recommendations are presented in a general manner and are not specifically fitted to local needs.

Policy and Ethics

The chief purpose of the Cotton Insect Conference is to enable state and federal entomologists to make information readily available to each other which may be useful in further research and extension work in cotton insect control. This exchange of information makes mutual support possible. The obvious purpose of improvement of research and extension work in cotton insect control is to reduce losses caused by insects.

While agreement on major recommendations may be expected, complete standardization is not possible. Details of recommendations must vary with requirements of the region or locality. Such differences are sometimes interpreted as disagreement among entomologists and can be a basis for confusion. Cotton growers should follow the advice of qualified entomologists in their respective states who are familiar with their local problems to avoid this confusion.

It should be recognized that procedures, equipment, and materials that may be effectively used in control of the various insect pests of cotton are now known. This adds to the stability of control recommendations. Research is continued, however, to find new procedures, equipment, or materials which may have advantages over those now in use. In bringing the results of new research to public attention, the impression that a panacea for all problems is being introduced tends to discredit all other work and should be forestalled. It is desirable that results of research should not be reported to the public, or made a basis for recommendations, until they have been made available to other entomologists working in the same field.

In making recommendations for the use of insecticides, entomologists should recognize their responsibility with regard to the hazards to public safety and other interests involved in the use of such materials.

Unfortunately, various so-called boll weevil "remedies" of little or no value have been put on the market through the years. Although some had slight value, usually most were less effective and more expensive than widely tested standard methods of insect control. Cotton growers are urged not to risk wasting money experimenting with unapproved devices, materials or mixtures. Many cotton farmers are persuaded by salesmen to spend much money in purchasing mixtures and machines that have little or no value in increasing yields or improving quality of cotton.

Hazards and Precautions in the Use of Insecticides

Development of new synthetic organic insecticides provides more effective means of controlling insects, but numerous problems have been intensified by these new chemicals such as hazard to man, domestic animals, crops, and beneficial wildlife. Most insecticides are poisonous to animals and man. They should be used with appropriate precautions because of this.

The factor of immediate toxicity of insecticides is of great importance to the user, to livestock, beneficial insects, and plants. There is, in addition, the effect of chronic toxicity due to repeated exposures, of accumulations in soils, and of residues on treated plants and on adjacent crops caused by drift. Everyone concerned with insecticides and their use should be thoroughly familiar with these various hazards. Proper precautions should be taken when formulating, packaging, labeling, and applying these materials.

• **Precautions for the User**—In considering the hazards to man, it is necessary

FOR MAXIMUM WALLOP!

always use

GENERAL CHEMICAL
COTTON DUSTS and SPRAYS

Whatever pest control problems this coming season may bring . . . there's the *right* General Chemical Cotton Dust or Spray to do the job for you.

That's because General Chemical cotton poisons are formulated to meet growers' special needs. Each has the important qualities of high deposit and maximum killing effectiveness built right into it. This reputation for giving real protection has been known to southern growers since the turn of the century!

So remember—no matter what pest control problems you may face—you can always get the *right* General Chemical Cotton Dust or Spray for your needs. Available from dealers everywhere.

General Chemical Cotton Dusts & Sprays

BHC—DDT—SULFUR

3-5-0	3-10-0	3-0-0
3-5-40	3-10-40	0-10-0

GENIPHENE†—SULFUR
(Toxaphene)

20-0 20-40

ALDRIN—DDT—SULFUR

2½-5-0	2½-5-40	2½-0-0

DIELDRIN—DDT—SULFUR

1½-5-0	1½-5-40	1½-0-0

PARATHION

1% 2%

†General Chemical Trade-Mark

EMULSIFIABLE SPRAY CONCENTRATES FOR COTTON

DDT EM-2 (2 lbs. DDT per gal.)
BHC EM-1.6 (1.6 lbs. gamma isomer BHC per gal.)
BHC—DDT EM 3-5 (1.2 lbs. gamma isomer BHC and 2 lbs. DDT per gal.)
GENIPHENE EM-4 (4 lbs. Toxaphene per gal.)
GENIPHENE EM-6 (6 lbs. Toxaphene per gal.)
GENIPHENE EM-8 (8 lbs. Toxaphene per gal.)
ALDRIN EM-2 (2 lbs. Aldrin Equivalent per gal.)
DIELDRIN EM-1½ (1½ lbs. Dieldrin per gal.)
PARATHION EM-2 (2 lbs. Parathion per gal.)
PARATHION EM-4 (4 lbs. Parathion per gal.)

COTTON DEFOLIANT
Potassium Cyanate

PRE-EMERGENCE WEED KILLER
Dinitro Spray Concentrate

ORCHARD BRAND SPRAYS & DUSTS

Also other organic insecticides and other defoliants for cotton.

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

***Offices Serving the Cotton South:* Atlanta, Ga. • Birmingham, Ala. • Charlotte, N. C. • Greenville, Miss. • Houston, Texas • Jacksonville, Fla. • St. Louis, Mo. • Baltimore, Md.**

to distinguish between immediate hazards (acute toxicity) and the accumulative effects (chronic toxicity). Man can be poisoned by breathing most insecticides, or by absorbing them through the skin, as well as by swallowing them.

Most solvents used in preparing solutions or emulsions are poisonous. Some are inflammable. Research and experience indicates that new chlorinated organic insecticides are reasonably safe to man and higher animals at strengths normally applied for cotton insect control. In concentrated form, some of the chlorinated hydrocarbon insecticides may cause acute poisoning when they contact the skin or when they are swallowed. Continued contact with, or exposure to, such materials may result in an injurious accumulation of the toxic ingredient in the body. Persons engaged in applying these insecticides should avoid unnecessary exposure to them. It is advisable to wear a respirator with suitable filter pads. Hands should be washed thoroughly before food is handled. After a dusting or spraying operation is complete, and at least once a day when handling or applying insecticides, it is advisable to bathe and change clothes.

Phosphorus compounds such as parathion and tetraethyl pyrophosphate **are extremely poisonous materials and must be handled with great care.**

It is not practicable to give all precautionary measures here that should be taken when phosphorus compounds are used. Such information is available through basic manufacturers, or the Bureau of Entomology and Plant Quarantine. All users should be thoroughly familiar with precautions and see that they are followed.

An important precaution to observe is the avoidance of breathing wettable powders, dusts, sprays, or vapors. When handling or applying parathion, use a respirator that has been passed by the U.S. Department of Agriculture. A mimeograph circular dated Aug. 24, 1951 was issued by the Bureau of Entomology and Plant Quarantine under the title "Respiratory Devices for Protection Against Inhalation Hazards of Dusts, Mists and Low Vapor Concentrations of Certain Insecticides."

Loading and mixing should always be done in the open. Impervious gloves should be worn if it becomes necessary to handle the materials, but it is best to avoid unnecessary contact with insecticide sprays as well as dusts. Concentrated emulsions and wettable powders are especially dangerous. As soon as possible after the use of phosphorous compounds, exposed personnel should bathe and change clothes.

It is advisable to have at hand in the field a change of clothing, soap and water, and a small supply of 1/100-gr. atropine tablets for emergency use, as recommended by competent medical authorities. Quick action is essential in case any symptoms of poisoning appear. Persons directing control operations should assume full responsibility for enforcement of adequate precautions and should have had medical advice as to emergency atropine use.

Spraying or dusting operations should be done under such conditions and in such a manner as to avoid excessive drift to adjacent fields where animals are pastured or where food crops are being grown. No organic phosphate should be applied by aircraft or custom sprayers in such a manner that unprotected persons will be exposed to dust or spray. Care in preventing drift is also essential because certain varieties of plants and kinds of crops may be injured by some insecticides. Spillage of insecticides should be be avoided where they might contaminate water used by man or livestock.

Excess dusts or sprays, even in small quantities, should be deeply buried.

Empty containers in which insecticides have been packaged should be burned or otherwise destroyed as soon as empty. Insecticides should always be clearly identified by labels and stored in a place where they are inaccessible to irresponsible persons or domestic animals.

Equipment used for applying weed killers should not be used for applying insecticides because of danger of crop injury.

• **Residues in Soils**—The effect of insecticides on germination, rate of growth, and flavor of crops may be influenced by type of insecticide, formulations used, soil type, kind of plant, and/or concentrations of residue in the soil. Information so far indicates that no immediate hazard to crops is involved when amounts and concentrations recommended for the control of cotton insects are followed. Injury has been demonstrated to several crops by higher rates of application of some insecticides on certain soil types. Benzene hexachloride may cause off-flavor of some root crops. The possibility that off-flavor may occur in peanuts grown in fields where cotton was previously treated with benzene hexachloride is being investigated.

• **Safeguarding Beneficial Forms of Life**—Insecticides destroy beneficial as well as injurious insects. Some are highly toxic to fish and other forms of aquatic life. It is especially important to use minimum amounts where there would be an unavoidable drift to ponds and streams. Every precaution should be taken to avoid the pollution of streams and farm ponds stocked with fish in disposing of excess spray or dust materials, or when cleaning dusting or spraying equipment.

• **Preventing Bee Losses**—Dusting cotton may cause heavy losses of field bees. Calcium arsenate appears to be the most dangerous insecticide in this respect because field bees may carry it to the hive where it is fed to the developing brood. Organic insecticides employed for cotton insect control, however, do not reach the brood. Toxaphene appears to be less hazarous to use than benzene hexachloride or DDT where bees are working flowers. Chlordane appears to be more toxic to bees than DDT or benzene hexachloride. No information has been obtained about the effect on bees of aldrin and dieldrin.

To hold bee losses to a minimum, the following suggestions are made:

1. Unnecessary dusting or spraying should be avoided by careful scouting and timing.

2. Cotton growers should notify beekeepers before dusting or spraying so that bees can be moved. Beekeepers should contact cotton growers before the cotton insect control season begins and request their cooperation. County agents may serve as clearing houses for such notifications. County agents and cotton growers should be given the exact location of apiaries.

3. Beekeepers should be kept informed of cotton insect infestations and recommendations for their control. This will enable them to locate bee yards in the safest available places and to know where and when insecticide applications are to be made.

4. Dusting or spraying should be done under good atmospheric conditions and care exercised to avoid drift, particularly into bee yards.

5. Other things being equal, the insecticide used should be one least toxic to bees.

6. Cultural control measures should be used to reduce necessity for insecticidal control.

Bee losses can be reduced if better understanding and cooperation can be developed between beekeepers and cotton farmers.

Methods of Applying Insecticides

• **Dusts**—The new organic insecticides are used as toxicants in dust mixtures with carriers such as talcs, pyrophyllite, and clays, or in mixtures with other insecticides. Too much emphasis cannot be placed upon proper formulations.

Progress has been made in the formulation of good quality dusts for use on cotton. Reports of poor results are often due to improper application. Research workers have attributed erratic results and poor control in some instances to inferior dusting qualities of the mixtures. Use of mixtures with excellent dusting qualities is in the interest of insecticides conservation, which is essential in view of the present insecticide supply situation. More information is needed concerning insecticidal formulations to establish criteria for suitable organic insecticide dust mixtures.

Sulfur as a diluent gives dust mixtures certain undesirable physical properties. The supply of sulfur was short in 1951 and it is expected to be even more so in 1952. Sulfur should not be used as a diluent for other insecticides so that available supplies will not be wasted. Where spider mites are a problem, however, at least 40 percent of a good grade of dusting sulfur or appropriate amounts of some other suitable miticide is desirable in the mixture.

• **Sprays**—Several organic insecticides were applied widely in spray form during 1950. Results during the last three years proved that concentrated sprays of organic insecticides will control cotton insects as well as dusts. Sprays have a wide range of usage. They can be applied during most of the daylight hours, even under conditions of relatively strong winds (15 miles per hour). Boll weevil control can be obtained with as little as 1 gallon, or as much as 15 gallons, of spray per acre with the toxicant remaining constant at the recommended rate. Sprays can be applied successfully to cotton for control of all major cotton pests. Most of the new organic insecticides can be made into emulsifiable concentrates which, with the addition of water, give emulsions suitable for application. Slight foliage burning has been noted in some instances when the emulsifiable concentrate was poorly formulated, or when the emulsion was improperly applied, or when the spray was poorly distributed.

Most oil solutions of insecticides tested caused foliage injury. Tests of experimental oils indicate that the viscosity

(Continued on Page 50)

COLUMBIA-SOUTHERN

• producers of

BENZENE HEXACHLORIDE

• developers of

CHLORO-IPC

COLUMBIA-SOUTHERN
CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
FIFTH AVE. AT BELLEFIELD · PITTSBURGH 13, PA.

DISTRICT OFFICES: BOSTON • CHARLOTTE • CHICAGO • CINCINNATI
CLEVELAND • DALLAS • HOUSTON • MINNEAPOLIS • NEW ORLEANS
NEW YORK • PHILADELPHIA • PITTSBURGH • ST. LOUIS

In '52: Save the Bolls - Produce the Bales

Progress of Cotton Insect Control In the Southeast

By L. C. FIFE

■ THE AUTHOR terms early-season control of thrips and the boll weevil one of the most important recent developments in the Southeast, and says "the early crop must be protected to produce a full crop."

GREATLY IMPROVED methods of cotton-insect control have been developed in the Southeast during recent years. Growers are showing keener interest in this subject than ever before, especially farmers with small acreages. This increased interest is due largely to the fact that better and cheaper insect control has been clearly demonstrated by the use of these improved methods. It is no longer necessary to persuade the farmer that insect control pays big dividends. He is now eager to obtain the latest information and put it to use to the best of his ability.

The large attendance at the numerous meetings arranged by various farm organizations, such as the Farm Bureau, veterans training groups, and Future Farmers of America, as well as by county agents, is convincing evidence of this keen interest. As a result the increased use of insecticides in 1952 and thereafter is anticipated.

Outstanding progress has been in the use of the new organic insecticides, more effective spray formulations and improved equipment for applying sprays, early season control, and the wider use of defoliants and beneficial cultural practices.

Federal and state entomologists in most of the cotton-producing states and the insecticide industry in general have contributed in the development of these improved methods. For several years research and Extension entomologists have been holding annual conferences to review and discuss the results of their experiments. The information obtained from these meetings has been of great value to the Extension Service in each state in formulating control programs.

Probably one of the most important recent developments in this region is early-season control of thrips and the boll weevil. Many entomologists are firmly convinced that everything possible should be done to make an early crop. A pest that retards the growth of the cotton plant, especially from the seedling stage to four weeks after the first bloom appears, must be controlled, especially in this area of low soil fertility. Under such conditions the crop matures early, particularly the quick-maturing varieties of cotton. Therefore, the early crop must be protected to produce a full crop.

Since 90 percent of the crop is normally set during the first month of blooming, good insect control during this period is essential.

It is also of utmost importance to concentrate on the crop during the first four weeks of fruiting. Pests that interfere with vigorous early-season development must be controlled. Otherwise the plant will be forced into a highly vegetative state. It will become rank and leafy before heavy fruiting starts, and eventually it may invite severe boll rots, and boll weevil and bollworm infestations. Farmers cannot afford to take this risk.

In many parts of the Southeast all or most of the boll weevils emerge from hibernation within 5 weeks after the first squares appear. For this reason most of the states are recommending that poison applications be begun at squaring and repeated at 7-day intervals for three to six applications, if boll weevils are present. One or two applications of poison in the presquare stage are recommended for thrips control if these insects cause noticeable injury.

When it first comes out of hibernation, the boll weevil is weak and can be killed with a much smaller dosage of insecticide than later in the season. With the previous method of waiting until 25 percent of the squares were destroyed, there were more weevils to kill and a higher dosage applied at more frequent intervals was necessary to give effective control. Furthermore, there was considerable loss in yield of the early crop.

The use of the new organic insecticides applied as emulsions with low-gallonage, low-pressure spray machines

L. C. FIFE is Entomologist, U.S. Department of Agriculture, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, Florence, S. C.

is one of the most outstanding developments in cotton-insect control for many years. The farmers have been quick to recognize the many advantages of applying insecticides as emulsion sprays over dusting, and their use is rapidly gaining in momentum.

Sprays for the control of cotton insects were first recommended in South Carolina in 1950, and in Marlboro County alone more than 100 sprayers were being used in 1951. In most of the states in the Southeast similar changes are taking place. To the research entomologist such progress is very encouraging.

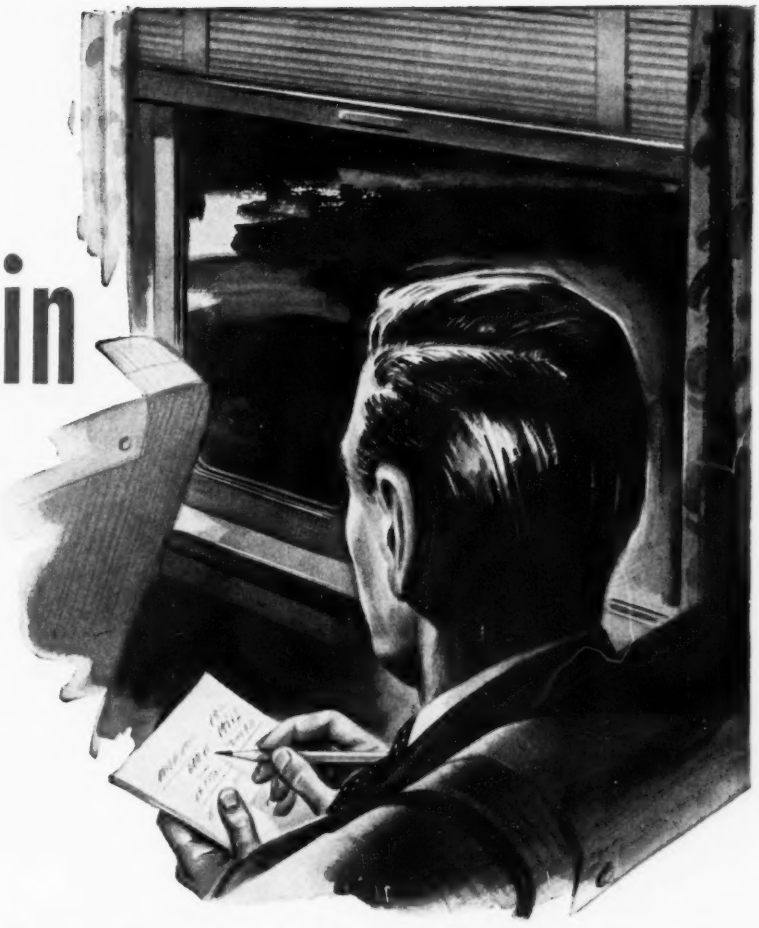
Sprays are cheaper than dusts and more satisfactory for early-season applications, especially when spraying and cultivating can be done in one operation. Because the plants are small, more of the insecticide is deposited per unit of leaf surface.

Sprays can be applied under a wider range of conditions, even with fairly strong wind. Spraying is done in the daytime when the plants are dry. If it rains within 24 hours, the application need not be repeated in 48 hours, as is recommended for dusts.

Calcium arsenate dust and the 1-1-1

(Continued on Page 38)

the man in seat 14



"Doc" MacGee says: While the rest of the world sleeps, this man rolls through the night on important business.

He's the Skellysolve Technical Fieldman . . . on his way to help a distant manufacturer solve a new or knotty problem . . . a problem involving the most efficient application of Skellysolve . . . to achieve more uniform and bigger production at less cost.

Trained, experienced trouble-shooters like this Skellysolve Technical Fieldman are "on call" for industrial users of Skellysolve. In other words, the Skellysolve Technical Fieldman is living proof that you get far *more* than a fine solvent when you buy Skellysolve.

You get a skilled engineering service that's bound to be reflected in comparative freedom from solvent worries . . . greater safety in manufacturing operations . . . and savings in your operating costs.

Urgent or routine, whatever your solvent problems may be—seek the advice of your Skellysolve Technical Fieldman for the right answers. Helping to overcome solvent problems is his business!

SKELLY **Skellysolve**

SOLVENTS DIVISION, SKELLY OIL COMPANY
KANSAS CITY, MISSOURI

Skellysolve

a leading name in solvents for more than 20 years

A pioneer in the development of close cut fractions, Skelly Oil Company is known for leadership in the engineering, development and marketing of solvents for industrial use.

Skellysolve is your password to dependability of supply . . . plus unsurpassed purity, uniformity, close boiling ranges and special properties to fit your particular needs. Write or wire for more complete technical information.

Brannan Announces Support For Soybeans and Corn

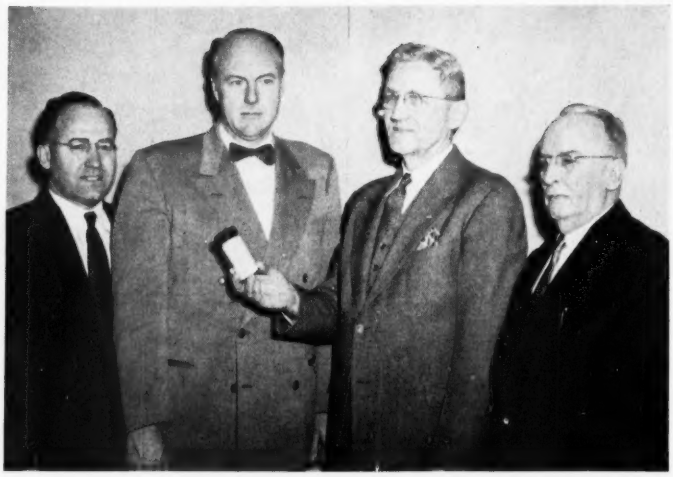
The USDA has announced that 1952-crop corn will be price-supported at not less than a national average of $1.60 a bushel and soybeans at $2.56 a bushel. Dollars and cents supports are announced at this time—in advance of spring planting—in accordance with forward pricing provisions of the Agricultural Act of 1949.

Support for corn—a basic commodity,—has been announced at a minimum level, subject to upward revision if 90 percent of parity for corn at the beginning of the 1952 marketing year next October is greater than $1.60 a bushel. In no event, however, will the support for corn be lower than a national average of $1.60 a bushel. Support for 1951-crop corn is $1.57 a bushel. Price support will be implemented, as heretofore, by means of Commodity Credit Corporation loans and purchase agreements.

Support for 1952-crop soybeans—a nonbasis commodity—has been announced at a fixed level of $2.56 a bushel, which reflects 90 percent of parity as of Nov. 15, 1951, in accordance with a support-level announcement made by Secretary Brannan last November. Support for 1951-crop soybeans is $2.45 a bushel. Price support will be implemented by CCC loans and purchase agreements.

• More than half of the deaths from fires are in rural areas.

• All wells, regardless of type, should be located on high well-drained soil.



Southern Laboratory Collaborators At Meeting in New Orleans

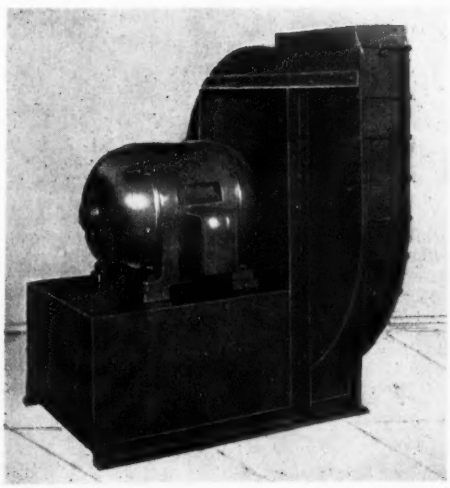
SHOWN HERE are three of the four representatives from the oilseeds indsutry serving as collaborators of the Southern Regional Research Laboratory who met with Laboratory scientists at New Orleans early in February. Purpose was to review and evaluate the Laboratory's research program. Shown, in the usual order, are Dr. C. H. Fisher, director of the Laboratory; Porter A. Williams, South Texas Cotton Oil Company, Houston; H. S. Mitchell, director of laboratories, Swift & Company, Chicago; and E. C. Ainslie, The Buckeye Cotton Oil Company, Atlanta. Unable to attend was Dr. M. L. Anson, director of biochemical research, Thomas J. Lipton, Inc., Hoboken, N. J.

THE RUBBER BLADE COOLING FAN

Recognizing the advantages of this fan, many of the leading engineers have adopted it exclusively.

This fan is capable of developing a vacuum of 36 inches in water. Resistance of seed is only a small percent of this capacity; balance is free to pull cool air through the seed.

Cooling Seed the Quickest Way Can Be Too Slow



HUBERT PHELPS MACHINERY CO.

1700 East 9th St. **Little Rock, Arkansas**

WANT BIGGER COTTON PROFITS?

FOR EXTRA YIELDS PER ACRE START THIS *ORTHO* PROGRAM NOW

✓ **Plan Ahead—Buy Now**

Schedule your pest control program well in advance and get better results. For free counsel, call your nearest ORTHO Fieldman—one of a large staff of specially trained experts located throughout the cotton growing area.

✓ **Poison Early**

Cotton authorities agree early prevention pays off with bigger crop dividends. Also, growers report plants treated early are more vigorous and show superior growth and production. This year—get the jump on the bugs!

✓ **Be SURE with the Best Insecticides**

Special ORTHO dust-mixing equipment assures micro-fine particles with better "sticking" qualities. The complete line of ORTHO cotton insecticides is "tailor-made" for changing local conditions at strategically located plants.

always—you profit with ORTHO

T. M. REG. U. S. PAT. OFF.: ORTHO

CALIFORNIA SPRAY-CHEMICAL CORP.

Oklahoma City, Okla.	Whittier, Calif.	Caldwell, Idaho
Shreveport, La.	Sacramento, Calif.	Maryland Heights, Mo.
Goldsboro, N. C.	San Jose, Calif.	Fennville, Michigan
Orlando, Fla.	Portland, Ore.	Elizabeth, N. J.
Fresno, Calif.	Richmond, Calif.	Medina, N. Y.

World leader in scientific pest control

ORTHO

Insect Control in the Southeast

(Continued from Page 34)

molasses-calcium arsenate-water mixture for mopping were once used extensively in the Southeast for boll weevil control. Since the development of the effective organic insecticides, however, their use has rapidly declined.

Several organic insecticides are now recommended in most of the Southeastern states for cotton-insect control. They are aldrin, BHC, dieldrin, heptachlor, toxaphene, chlordane, parathion, and Aramite. The development of such a wide choice of chemicals is no small accomplishment. The farmer now has facts concerning their relative merits and can choose the cheapest and most effective against the pests infesting his fields.

We are still searching for more effective and cheaper pesticides. We seriously need one that will not kill the beneficial parasites and predators, and that is relatively non-toxic to man and domestic animals. Fortunately, some of the new systemic poisons show promise in this respect.

Several large growers are now employing young men to make counts of the various cotton pests weekly throughout the season. These counts serve as a basis for determining where and when to apply poison. By eliminating all guesswork, this system makes it possible for a farmer to save from 25 to 50 percent of his insecticide and labor bills. If additional poison is needed, the investment will pay big dividends through greatly increased yields. The usual charge of one dollar per acre for the season is an excellent investment to the large farmer for this service.

Another important development is the wider use of defoliants for the control of boll rots and late infestations of various cotton pests. This practice fits well into our present program of insect control; namely, plant early, poison early, and destroy stalks early for more profit.

Although defoliation may be considered as a measure of cotton-insect control at the end of the season, any lack of boll weevil control will contribute to defoliation inefficiency. Any insect, disease, or physiological condition of the cotton plant that prevents fruiting will also indirectly limit the efficiency of the defoliation practice.

Destruction of the green cotton stalks before frost has long been recognized as an important cultural practice for controlling the boll weevil. During the last several years the lack of sufficient labor to harvest the crop early has made it almost impossible to destroy the stalks before frost. With the wider use of the mechanical cotton picker and the improved stalk cutters or shredders, it should soon become a general practice.

The possible injury to soils and subsequent crops by the use of the new insecticides is now being studied. Many long-range experiments are now in progress, and although the final results will not be known for several years, some rather definite information is now available.

In 1947 experiments to study the effect of soil applications of BHC, DDT, and toxaphene on five crops grown in a 3-year rotation were begun in cooperation with the Bureau of Plant Industry, Soils and Agricultural Engineering and the South Carolina Agricultural Experiment Station. These crops included cotton, tobacco, cowpeas, oats, and Austrian winter peas.

On an acre basis the treatments included 10 and 20 pounds of DDT, 16.7 pounds of BHC, 12.5 pounds of BHC plus 2.5 pounds of DDT, and 20 pounds of toxaphene. All of these treatments were repeated annually before planting. Other treatments, applied only at the beginning of the experiment (1947), included 40 and 100 pounds of DDT, 83.3 pounds of BHC, and 50 pounds BHC plus 10 pounds of DDT. These insecticides were incorporated in the soil so as to test in as short a period as possible dosages comparable to residues that might eventually build up in practice. However, it is doubtful whether the accumulations that would result from normal applications of the insecticides to foliage would be comparable to the high dosages tested.

Cotton did not seem to be affected by the DDT treatments. Only the 100-pound dosage of this insecticide appeared to cause injury to the tobacco. All except the 40-pound dosage affected the cowpeas, but these effects were not apparent until 1948.

The 100-pound dosage of DDT reduced the yield of cowpeas in the hull in 1948 and reduced the stand of plants in 1948 and 1949. Three annual applications of 10 or 20 pounds of DDT per acre reduced the stand and growth of the cowpea plants.

The 100-pound dosage of DDT retarded the growth of oats and Austrian winter peas. Rye was also susceptible to injury by DDT.

Toxaphene at 20 pounds per acre was less injurious than DDT at the same dosage.

All BHC treatments affected the flavor of the tobacco in 1947, the only year in which the tests were made. In 1947 the 50- and 83.3-pound dosages reduced the stand of tobacco where the plants were set shortly after the insecticides had been applied. In 1948 and 1949 all dosages of BHC gave some control of the root-knot nematode on tobacco, and in 1949 a slightly higher yield was obtained from the plots receiving the two highest dosages in 1947.

In 1947 all dosages of BHC reduced the stand of cotton when it was planted shortly after the insecticides had been applied, but in subsequent years none of these treatments caused damage to the cotton.

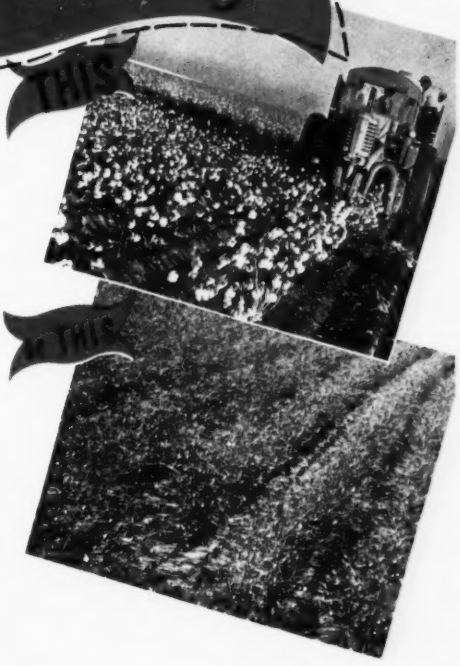
A number of investigators have demonstrated that heavy dosages of DDT or BHC incorporated in the soil will harm certain crops. Heavy dosages are not likely to be used, however, unless the pest is so important economically that its spread cannot be permitted. Such a case is exceptional and should not be confused with ordinary plant-pest control problems.

The possibility of off-flavor in peanuts grown in soil that had been dusted in previous years with BHC for cotton-insect control was an important problem to consumers, peanut and cotton growers, and the insecticide and food industries. In a preliminary study samples of peanuts were collected from 66 fields that had been treated with BHC and

In '52: Save the Bolls – Produce the Bales

A FERTILIZED winter legume feeds and protects the land, and provides an opportunity for higher yields.

What are you selling....



If it's sure results you want to sell (and what else in the cotton business pays off year after year) you'll want the famous quality and competitive prices of the Colorado .44 brand always.

If your customers are suffering crop losses to boll weevils, boll worms, cotton aphids, thrips and other cotton insects, sell them Colorado .44 Cotton Dusts and Liquid Sprays. These profitable, fast-selling formulations include Toxaphene, DDT, Sulphur, Aldrin, Dieldrin and BHC alone or in combination. Phone, write or wire today.

Chemical Corporation of Colorado

P. O. BOX 777
DENVER, COLORADO
AComa 5895

COLORADO 44 BRAND

from 16 untreated fields in South Carolina, North Carolina, Georgia, and Alabama. Three varieties were included—Spanish, Runner, and Virginia Bunch. A portion of each sample was processed into peanut butter on a pilot-plant scale. Palatability tests by two taste panels were not sufficiently resolved to permit the drawing of definite conclusions. Further tests are under way.

Very small dosages of some of the new organic insecticides are effective against a number of insects. Where such dosages have been found effective against a pest without causing a health hazard, and there is no evidence that they will cause serious plant injury, their use is justified. They should not be condemned merely because heavy dosages in the soil cause some damage to certain crops.

From the above it is obvious that rapid progress has been made in cotton-insect control in the Southeast. Research has paid big dividends, especially during recent years, and this work should be expanded for even greater progress in the future.

State Guides

(Continued from Page 28)

made to these trap crops or to other small areas where weevils are concentrated in large numbers.

Overwintered weevils lay eggs in squares and soon die. The damaged squares may not be noticed until they flare, by which time the old weevils are usually dead. Infested spots should be marked to serve as a guide for later scouting and dusting.

Control of First Brood Weevils

About five weeks after squaring begins, a new brood of weevils emerges. They are the first to mature in the current year. After a week of feeding, they begin to lay eggs and to migrate short distances, usually within the field.

Beginning four weeks after squaring starts, green squares should be inspected once a week for fresh punctures. Special attention should be given to spots where flared squares were found earlier. Most fresh punctures will be feeding marks. Egg-laying begins a few days later.

A boll weevil incubator is an aid in determining time of emergence of first brood weevils. To prepare an incubator, the earliest squares that flare from punctures made by overwintered weevils are put in a screen wire cage, and kept in a place with average temperatures but out of the sun. A fruit jar may be substituted, but this is likely to be warmer than field temperatures. Squares should not be allowed to dry out.

• **Spot Dusting**—In case of spot infestation, dusting should begin as soon as first brood weevils begin to emerge, as indicated by freshly-punctured squares. Infested spots and cotton for several yards in each direction is dusted. Applications should be repeated every four days as long as fresh punctures are found. Scouting should be continued, looking for new spots. Spot dusting gives maximum weevil control at low cost with little risk of bringing on outbreaks of bollworm, red spider, and aphid.

• **Blanket Dusting**—If an infestation is generally distributed over a field, field-wide or blanket dusting becomes necessary. In making counts to use as a basis for blanket dusting, 25 - medium sized squares are picked consecutively at one location. Flared squares or small squares are not included. An estimate of the infestation should be based on at least 200 squares in each 10 acres. Instead of picking 25 squares at each of several locations, squares may be picked at random while walking diagonally across the field. **With a moderate infestation and normal weather, applications should begin when about 25 per cent of the squares are punctured.**

A rapidly rising infestation is indicated by feeding punctures and an increase in the percentage of squares punctured. Wet weather favors weevil development. **Dusting should begin when 10 or 15 per cent of the squares are punctured, if it is a rising infestation in damp weather.**

A stagnant or falling infestation is indicated by egg punctures, instead of feeding punctures, and by little change or a drop in percentage of squares punctured. Dry weather kills weevil grubs and pupae in the squares. **With a stagnant infestation in dry weather, dusting is unnecessary unless 35 to 40 per cent of the squares are punctured.**

Repeat applications every four days until the infestation is brought under control. Keep scouting to determine progress of infestation and effectiveness of control. Watch for aphids, bollworm, and red spider.

Control of Later Brood Weevils

About four weeks after the first-brood weevils emerge, the second-brood weevils begin to emerge from squares punctured by the first brood weevils. The second brood usually develops faster than the first, since temperatures are higher in July than in June. Second-brood weevils emerge before the last of the first brood die, and there is usually no weevil-free period at this time. Third and fourth broods follow in rapid succession. Heavy weevil flights occur when the supply of squares is exhausted. In outbreak years like 1949 and 1950, these weevils are so much more numerous than first-brood weevils that control is more difficult. However, regular dusting will enable infested fields to continue fruiting and will delay or prevent migration of weevils from dusted fields. This protects uninfested fields from migrating weevils and makes it easier for all farmers to protect their cotton.

Dusting must continue until bolls are at least 16 days old. Quitting too early results in loss of much of the benefit of control already accomplished. As plants mature, the percentage of punctured squares rises because of scarcity of squares. Boll protection can still be obtained, however.

BOLLWORMS

Bollworms on cotton are the common corn earworm and the tobacco budworm. Natural outbreaks of bollworm often occur independent of insecticidal treatments. However, use of organic insecticides destroys insidious flower bug, big-eyed bug, and other predatory insects that help to prevent bollworm outbreaks. Aphid infestations help bring on bollworms because the bollworm moths are attarcted to honeydew, and because beneficial insects which might eat bollworm eggs are busy eating aphids.

Bollworm eggs are pearly white and about the size of a pinhead. They can be seen on the upper surface of the terminal leaves.

Newly hatched worms tunnel through the terminal growth and bore into tiny squares. These squares turn brown or black. The small worm hole can be seen going through the square. Larger worms move down the plant, boring into squares and bolls.

Inspect terminal growth for bollworm eggs and small worms each time the cotton is scouted for weevils. Count 100 terminals in a field. If an average of 4 or 5 small worms, plus additional eggs, are found to 100 terminals, it is usually time to apply insecticides.

In fields which have not received any insecticides, treatment may be delayed a few days to give beneficial insects a chance to destroy an infestation. Careful scouting is required or bollworms may become too large to control. It is very important that worms be controlled before they get to the large squares and bolls. Larger worms are difficult to control and require heavier applications of insecticide.

DDT is the most effective insecticide for bollworm. Five per cent DDT should be added to the organic insecticides being used for weevil control. It should be increased to 10 per cent DDT if a bollworm outbreak occurs. Toxaphene is next in effectiveness. Adding DDT will increase effectiveness of toxaphene sprays.

(For complete information on bollworm see Arkansas Extension Service Leaflet No. 98).

RED SPIDER

Red spiders are red or tan mites, barely visible to the naked eye. They live on the undersides of leaves and suck sap from leaves, causing the upper surfaces to turn red. In severe infestations, leaves drop off. Dry weather favors red spiders. They cannot fly, but are spread through a field mechanically on cultivating equipment and the like.

Predatory and parasitic insects ordinarily keep red spider mites under control. New organic insecticides, ilke BHC, DDT, toxaphene, aldrin, heptachlor and dieldrin, kill these beneficial insects, but do not kill the red spider.

Each time cotton is scouted for boll weevils, plants adjacent to turn rows, field margins and stumps should be inspected for red spider. Look for red leaves or for white stippling on the upper surface. Look on the underside of the leaves to find the mites.

To prevent spider mites, low-growing plants such as violets and wild strawberries, which are green in winter, should be destroyed in turnrows from around field margins, stumps, etc. This destroys winter hosts. To prevent build-up, insecticides should be used wisely

Quotes From Our Authors:

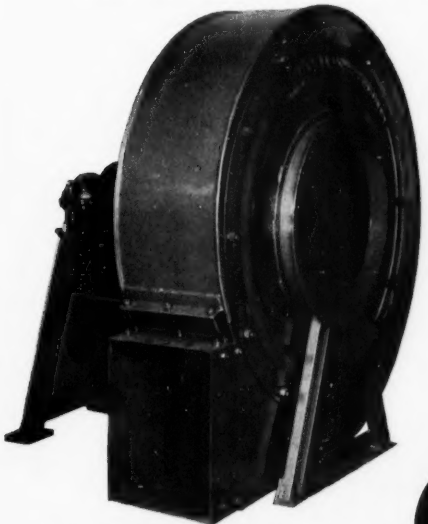
"THE COTTON FARMER not only must be sold on the value of cotton insect control in bringing him added profits, but also must be thoroughly indoctrinated in the use of recommended practices."

BOARDMAN SUPERBLAST FANS WILL SAVE YOU MONEY, TOO!

"Sure, I'm positive when I recommend SUPERBLAST fans—*mighty* positive. And mind you, I'm an oil miller, not a salesman. The reason I'm so strong on SUPERBLAST fans is because I've worked with them every season for the last 15 years. I *know* how well they stand up handling the fumigation of 700 tons of seed at a time—passing regular Government inspections on air pressure and vacuum—and without a bit of trouble from either chemical or mechanical causes. I'll vouch for the fine job they do exhausting lint in the lint rooms . . . circulating air in the seed rooms . . . or any other job we ever give them!

"My company operates some gins, too—and the boys there give a lot of credit to SUPERBLAST fans. They've never once had a gripe about the way SUPERBLASTS suck cotton off the trucks, or air-blast lint at the gin stands, or—well, you name it. SUPERBLAST fans can do the job, and *save you money!*"

HERE'S WHERE YOU CAN PUT YOUR FINGER ON SUPERBLAST ECONOMY . . .



- **Long-Lasting**—with thick, sturdy steel or cast-iron scroll and big, heavy-duty shaft and bearings.
- **Easy to Repair**—with *sectional* scroll and replaceable blast-wheel *blades.*
- **Light on Power**—with smooth-running, well-balanced blast-wheel that runs easier than many lighter fans.
- **Versatile**—with housing easily adjustable to 8 different positions; changes jobs without cost of new fan.

TAKE YOUR CENTRIFUGAL FAN INSTALLATION AND CAPACITY PROBLEMS TO . . .

THE BOARDMAN CO.
OKLAHOMA CITY, OKLAHOMA
1403 S. W. 11TH ST. PH. MElrose 8-5435

STEEL CONVEYOR BOXES & COVERS
PORTA-LOADERS
PNEUMATIC SEED CLEANERS

and all the organic insecticides dusts should contain 40 per cent of sulfur.

When red spiders are found treatment should begin. This can often be limited to spots unless mites have been spread over the field. An effort should be made to apply treatment to underside of leaves.

Recommended miticides are DN-sulfur mixture (0.5 per cent dinitro-o-cyclohexylphenol), ten or more pounds per acre, used as dust only. Aramite, ovatran and sulphenone are new organic sulfur compounds and have given good results on one year's trial. They can either be used as dusts or concentrate sprays.

APHIDS OR PLANT LICE

Aphids (plant lice) are small, yellowish-green, soft-bodied insects found on the undersides of cotton leaves. They suck sap from plants and excrete honeydew, a sticky liquid on which sooty mold grows. Plants shed their leaves because of aphid feeding. Honeydew and the accompanying sooty mold lower the grade of the lint.

Aphids multiply rapidly. Fortunately, lady beetles and other insect enemies keep them under control most of the time. Boll weevil control kills these beneficial insects. Spot dusting seldom causes aphid outbreaks because beneficial insects move back into treated spots.

Each time cotton is scouted, aphids should be counted. Select the fourth leaf down on the center terminal. Leaves on several plants should be counted. If an average of more than 5 aphids are found to the leaf they should be controlled.

Aphids can be controlled with 3-5-40. The insecticide should be applied late in the afternoon when the air is calm and after it begins to cool off. Morning treatment is not as effective.

Toxaphene used in every application for boll weevil control does not cause build up. It will not knock out an established infestation. Calcium arsenate is likely to cause aphid buildup, requiring an application of 3-5-40.

Dusting for Weevil Control

In experiments over a 28-year span, the Arkansas Agricultural Experiment Station found that dusting for boll weevil control more than doubled cotton yields. Dusting was done only in years of severe injury. Fields were chosen where there was active injury, and where infestation appeared to be increasing rapidly. In 1950, for example, dusted plots in Crawford County made an average of approximately 600 pounds of lint cotton per acre, while undusted plots made about 130 pounds.

On the other hand, dusting when flared squares are seen, or in years of light weevil injury, is not profitable. Poor results under such conditions have destroyed the faith of some people in dusting to control boll weevil.

Dusting should be done at the right time, and applied properly, if it is going to be done at all. If aphid, red spider, or bollworm infestations develop and are allowed to go unchecked, damage from them may offset gains from controlling weevils.

Here are some further suggestions:

1. Even distribution of dust is essential.

2. Dust at four-day intervals. Repeat at once any application that is washed off by rain within an entire daylight period for calcium arsenate or toxaphene, or within four hours for 3-5-40.

3. Three or more applications are necessary to hold weevils in check where infestation is general. Do not quit dusting until scouting shows that the infestation is no longer rising and fresh punctures are not being made, or until the crop is safe with all bolls two and one-half weeks old.

Spraying for Weevil Control

Although dusting is the preferred method, sprays may be used. Like dusts, sprays must be applied at the **right time** and the **right place** to be effective. Experimental work in 1951 showed control with sprays to be about equal with dusts. The poor results obtained by Arkansas farmers the past three seasons can largely be attributed to disregard for correct timing. Low dosages, poor equipment, and improper adjustment of spray equipment also contributed to failure of the spray method to give control.

Spraying with concentrate sprays is still a relatively new method of control and there are still a lot of unanswered questions. Sprays are more likely to cause red spider buildup and foliage injury.

In Spraying, 1 to 10 gallons of spray are applied per acre. Older types of sprayers—used for appliyng dilute water sprays—are not satisfactory for applying these concentrate sprays. Spraying can be done in a light breeze,

Protect Your Investment!

Buy ACOCK BRAND with confidence!

DEMAND

ACOCK BRAND

Cotton Poisons

Chemically Analyzed

We supply all cotton poisons as recommended by experiment stations. DEMAND . . . . ACOCK BRAND.

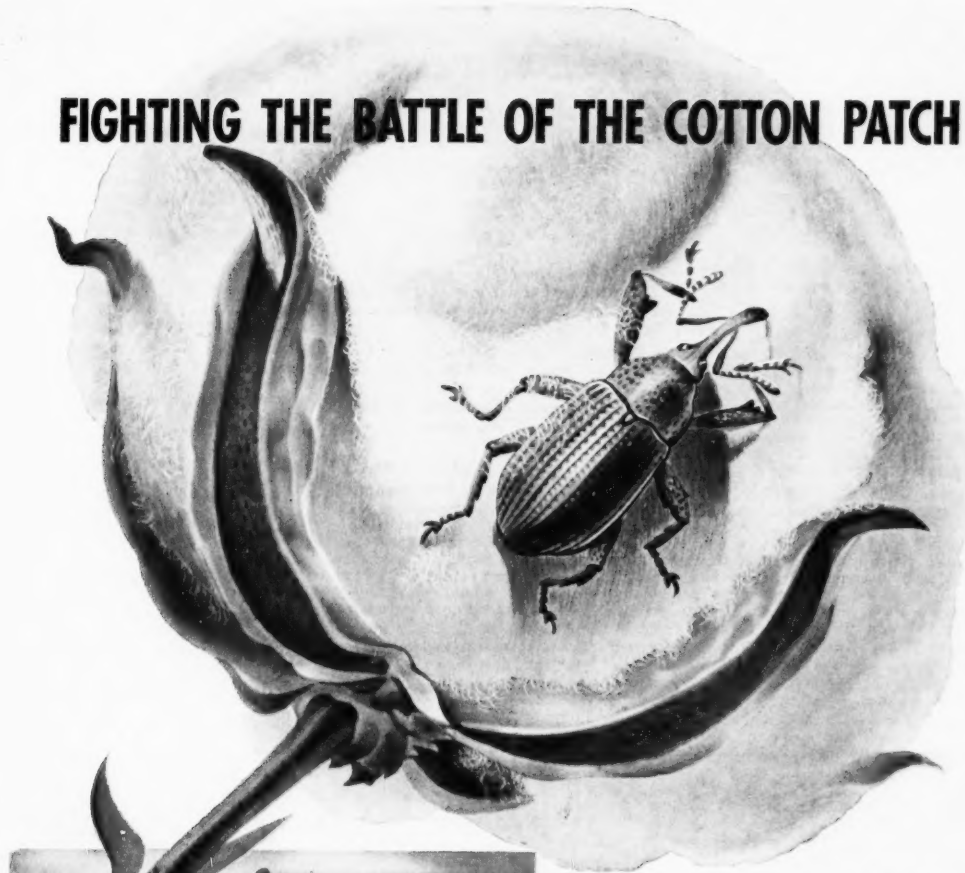
Write, wire or call us collect

ACOCK LABORATORIES, LTD.

Phone 2-5447 Austin, Texas

A postcard will bring you a reprint of "Guide For Controlling Cotton Insects In Texas 1952"

FIGHTING THE BATTLE OF THE COTTON PATCH



A Niagara Model AA Cotton Duster protecting up to 12 acres per hour with Niagara 3 N 1 cotton dust.

Over 17,000,000 bales of cotton will be required this year to supply heavy military and civilian demands. When you consider that one out of every six bales grown is destroyed by hordes of ravenous insects, cotton constantly needs the helping hand of chemistry in its fight for survival. Through close co-operation with cotton growers, agricultural schools and experiment stations, Niagara has developed the finest, scientifically formulated and tested dusts and sprays for controlling all major cotton pests that threaten this vital crop. Cotton growers are invited to use these better Niagara materials to their advantage. Consult Niagara field men, dealers, or write us.

Niagara CHEMICAL DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION
MIDDLEPORT, N. Y. • Richmond, Calif. • Jacksonville, Fla. • Tampa, Fla. • Pompano, Fla. • New Orleans, La. • Greenville, Miss. • Harlingen, Tex. • Pecos, Tex. • *Canadian Associate:* NIAGARA BRAND SPRAY CO., LTD., Burlington, Ontario

WHEN YOU BUY Niagara YOU BUY PROTECTION

FMC

making it possible to apply sprays during a day that is too windy for dusting.

RECOMMENDED INSECTICIDES

Satisfactory insect control may be secured by the proper use of any of a number of insecticides. In the conference of cotton entomologists, none of the recommended or substitute materials was reported as having given results better than any other. In the experimental work reported, such variations as occurred were within the range of experimental error. Success in control still depends on timing.

• **Calcium Arsenate**—Excellent for boll weevil control. Repeat applications that are washed off before an entire daylight perod has passed. To prevent buildup of aphids, use 3-5-40 as needed. Of the recommended insecticides, calcium arsenate has the best dusting properties and longest residual action. It also is the slowest killing one. Lime-free calcium arsenate is the same as calcium arsenate, but has had freelime removed so the material can be mixed with organic insecticides.

• **Toxaphene**—Excellent for boll weevil control, good for bollworm control, and prevents aphid build-up, if used in every application. Repeat applications that are washed off within an entire daylight period. Use 40 per cent sulphur in dust mixtures to prevent red spider buildup. Apply dusts in late afternoon, night, or early morning. Toxaphene is available as sprays.

• **3-5-40 (3 per cent gamma BHC, 5 per cent DDT, 40 percent sulphur)**—Excellent for boll weevil and aphid control, and good for bollworm control. Repeat applications washed off within four hours. Include sulphur to prevent red spider build-up. Use in late afternoon, night, or early morning. With mid-day applications, fumes of BHC are quickly dissipated and control is poor, despite the fact that many weevils are killed in open blooms. The 3-5 mixture is also available in liquid formulations.

• **DDT**—Excellent for bollworm control when used at 1 to 1.5 pounds of toxicant per acre. Five per cent used in formulations of certain insecticides to keep bollworms from getting out of control.

• **Nicotine**—Good for aphid control. For aphid knockout use 3 per cent nicotine in hydrated lime. Use in late afternoon, night, or early morning.

• **DN-sulfur**—Good for red spider control. Must be applied from underneath for best results.

• **Aramite-ovotran-sulphenone**—Good for certain species of red spider. Organic sulphur compounds.

SUBSTITUTE INSECTICIDES

Because of the toxicity of certain materials to warm blooded animals, they are listed as substitute insecticides. No recomendations can be made regarding the safe use of these materials, and further information is necessary before the degree of safety is established. Illnesses have been known to occur from use of aldrin. Heptachlor and dieldrin are compounds related to aldrin and should be handled with the same care. These compounds are toxic by skin absorption, inhalation, and ingestion. The effects may not be apparent immediately. Accumulation may occur in tissues and the effects delayed several days or weeks. These compounds should be used on cotton only where those applying them are fully aware of the hazards and will follow precautions prescribed by the manufacturer.

• **Aldrin**—Good for boll weevil. It builds red spider and bollworm. In mixtures with DDT, aphids also buildup. It is quick-killing, but slower than BHC. 2.5-5-40 (2.5 per cent aldrin, 5 per cent DDT, 40 per cent sulphur) is the preferred dust formula. In aldrin sprays, DDT should be included for bollworm control.

• **Heptachlor**—Controls and builds same pests as aldrin. It should be used in the same manner and dosage as aldrin.

• **Dieldrin** — Controls and builds same pests as aldrin and heptachlor. It has longer residual action and is effective at lower dosages. The preferred dust formulation is 1.5-5-40 (1.5 dieldrin-5 per cent DDT-40 per cent sulfur). DDT should be added to sprays.

1952 Cotton Insect Control Recommendations for:

California

These recommendations are made from: 1. The results obtained in California cotton insect control by several state and industrial research workers. 2. Cotton insect control in other states. 3. Control of the same insects and mites on other crops where applications and

BEST COTTON *for the* SOUTHWEST

DORTCH
No. 1

Breeders and Originators

ROBERT L. DORTCH SEED FARMS
Scott, Arkansas

formulations are comparable. 4. Cooperative contributions from the California State Department of Agriculture, University of California Agriculture Experiment Station and Extension Serivce. For further information with reference to these the cotton grower should see his County Agricultural Extension Service and the County Agricultural Commissioner.

The changes made in the recommendations from those of 1951 are to meet a continued shortage of sulfur; for greater coordination of cotton insecticides with other closely associated crops; greater protection of health; protection of the honey bee and beneficial insects.

The cotton grower is encouraged to use insecticides only when he is certain that they are needed. He is advised against applications of insecticides as preventatives because any unnecessary use of most of these recommended materials has resulted in outbreaks of certain mites and insects. Specific miticides and insecticides applied only in the infested portion of a field should be used whenever it is practicable. Where mites have been serious pests during the past few years, control of them on weeds and crops nearby is recommended. Weed oil and chemicals will result in greater kill of mites than can be obtained by cultivation methods.

Good control of cotton insects and mites will be obtained only when well formulated dusts and sprays are thoroughly applied under quiet weather conditions. Competent flagmen are essential for aircraft applications. They should insist on thorough treatment of the infested portion for the field, including cross flights for the ends of swaths and other necessary "dressing off" of the field.

Emulsibles and oils in sprays are more apt to injure the plants if applied when the temperature is 90° F or above. The sprays recommended in the schedule refer to emulsibles only and for use in low volume, low pressure sprayers or aircraft. The pounds per acre refer to the actual pounds of the insecticide contained in the spray.

There is too little known of the dangers of several of the newer insecticides for them to be recommended. There is also too little known about the effects on plants, insects, etc., of other newer insecticides which are apparently safe to operators, bees and livestock, to recommend them until a few more years of work have been done with them.

The most accurate checking on insect infestations and the need for control measures can be obtained from an entomologist who is trained or experienced in this work. Entomologists who are instructed and trained for Supervised Control of Insects are now permanently employed by the Westside Supervised Pest Control Assn., Producers Cotton Oil Co., Central Valley Cotton Cooperative, and by Boston Lands Company. Other cooperative groups, ranches or companies have arranged for the employ of such entomologists for the summer. For more information on this type of entomological assistance ask your County Farm Advisor in charge of field crops about Supervised Control.

Note 1. The acaracides or "miticides" are given in the order of preference for satisfactory control. The changes, such as omitting parathion and TEPP, previously recommended for the control of spider mites and others which one might expect included here, are made

California Insect Control Recommendations for 1952

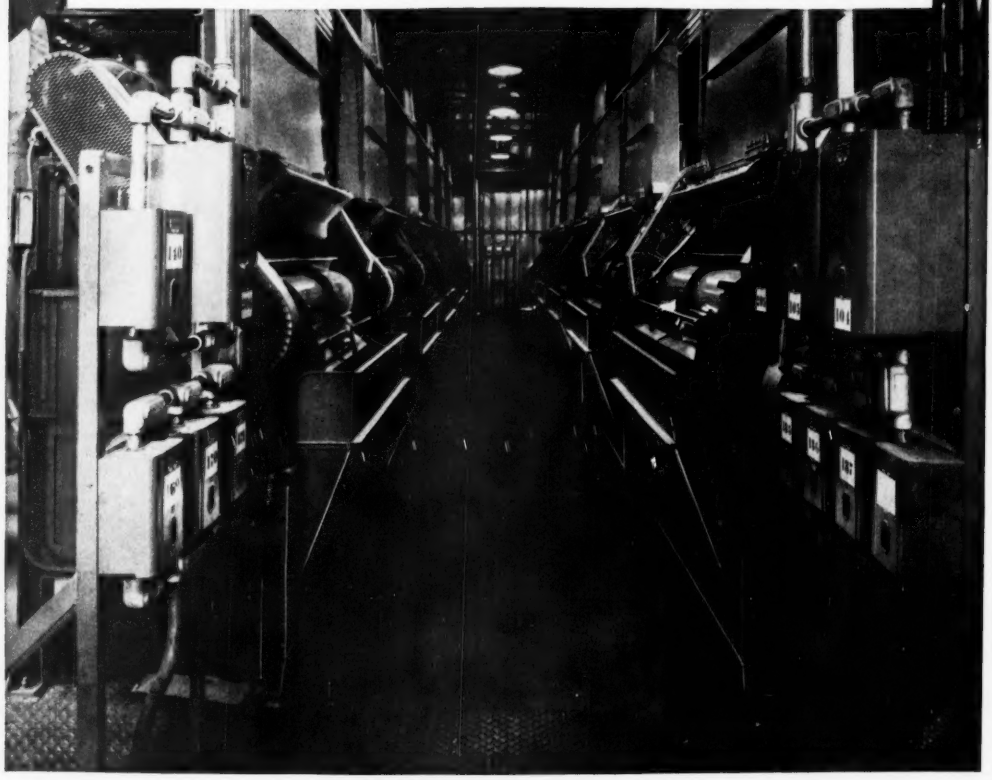
Insect	Usual Time of Injury	Recommended Procedure or Insecticide	Application and Remarks
Spider-mites	Throughout the season	Cultural practices	A year-round program of killing mites on weeds and other crops adjacent to cotton. Ask your Farm Advisor for help with this.
Atlantic mite	Throughout the season	Sulfur	15-30 #/A depending on the size of plants and equipment. Also with other insecticides execept Aramite.
Pacific mite	Throughout the season	Aramite (88-R)	¾-1 #/A actual in dust or spray by ground machines only. Not effective in the presence of sulfur. (Note 1.)
Two-spotted mite including T. multisetis	Throughout the season	Ovotran (K-6451)	1½-3 #/A actual in dust or spray by ground machines only. (Note 1.)
	Throughout the season	Sulfur	Use as soon as an infestation appears, repeating the application every 10 days until control is obtained. Least effective on two-spotted mite. (Note 1.)
Wireworms, seed-corn maggot, false wireworm	Seedlings	Lindane	1½-2⅔ oz. of 75% sprayed or slurried on seed with fungicide.
Cutworms	Seedlings	Cultural practices	Thorough cultivation, keeping soil clean of all growth at least 6 weeks before planting. (Note 2.)
		DDT or toxaphene	15-20 #/A of 10% DDT or 20% Toxaphene along rows. 1½ # DDT or 3 # Toxaphene in spray by ground machines.
Cutworms (sub-surface feeders)	Seedlings	DDT or toxaphene plus 2% g BHC	Same as above except with 2% g BHC added. (Note 2.)
Beet armyworm Small darkling beetles	Seedlings	DDT or toxaphene	Same as for cutworms.
Hornworm, larva of white-lined sphinx	Seedlings	DDT or toxaphene	Border strip barriers of dusts containing 10% DDT or 20% Toxaphene, dust plants lightly but thoroughly if necessary.
Thrips (onion and western flower)	Seedlings	None	Requires too many applications during continued heavy migration. Toxaphene at 2 #/A by ground machines has given the best results.
Lygus bugs Fleahoppers Green leafhoppers	June to Aug. 20	DDT or toxaphene	1-1½ #/A DDT or 2-3 #/A Toxaphene in dust or spray, when an average of 10 lygus per 50 sweeps occur. (Note 3.)
Yellow-striped armyworm	July to Oct.	DDT or toxaphene	Border strip barriers of 5% DDT or 10% Toxaphene. Dust plants thoroughly if necessary.
Cotton bollworm (corn earworm)	Mid-season to harvest	DDT	1½-2 #/A in dust or spray.
Bean thrips	Mid-season	DDT or toxaphene	1 # DDT or 2 #/A Toxaphene in dust or spray.
Stink bugs	Mid to late season, when av. of 1-3 bugs per 50 sweeps	Toxaphene or BHC	Toxaphene 4-6 #/A in dust or spray. 2% g BHC plus 5% DDT in dust at 30 #/A ½ # g BHC added to either 1½ # DDT or 4 # Toxaphene in spray per acre. Use BHC only when there is no hazard of imparting an off-flavor to other crops or of killing of bees.
Salt marsh caterpillars	Mid to late season	Toxaphene or toxaphene plus DDT	3-4 # Toxaphene in dust or spray per acre. 2-3 # Toxaphene in dust plus 1-2 # DDT.
Cotton aphid	Throughout season but often only in late season	Nicotine	All of these aphicides should be applied only on dry plants and in warm quiet weather. (Note 5.)
		Dusts #5, #8	Contain 1.8%, 2.9% nicotine, for ground machine applications only, 20-25 #/A.
		Dusts #8, #10	By aircraft. (Note 5.)
	Throughout season	Nicotine sulphate 40%	Only by ground sprayers 1 to 1½ pts. per acre.
	Late season	TEPP spray	Sprays only; 1 pt. of 40% or 1 qt. 20% by aircraft at 5 gals./A. TEPP is not recommended prior to 3-4 weeks before defoliation or in dust formulations. (Note 5.)
	Late season	BHC, only if no hazards exist of off-flavor in other crops or of killing of bees.	Dust of 2% g BHC, 20-30 #/A. Spray 0.4 # g BHC/A. (Note 5.)
White flies	Middle to late season	DDT emulsible	2 to 3 qts. of 25% emulsible in spray per acre, by ground machines.

MORE PROFIT

MODERN **CARVER LINTERS**

DUAL MOTOR DRIVE

RIGID • TROUBLE FREE • EFFICIENT



CARVER COTTON GIN CO.

DIVISION OF THE MURRAY CO. OF TEXAS, INC.

EAST BRIDGEWATER, MASS.

Phone or write our nearest office

MEMPHIS 146 E. BUTLER STREET • **ATLANTA** FOSTER STREET and SOUTHERN R. R. • **DALLAS** 3200 CANTON STREET

to reduce the following complications: 1. Two to three closely spaced and timed applications. 2. Determination of the species of mites present by growers and others. 3. Destruction of beneficial insects, the honey bee, etc. 4. Obtaining permits from Agricultural Commissioners for application of "injurious materials."

The warnings included in 1951 which referred to the applications of "injurious materials" are omitted because none is recommended which would come under the California State Department of Chemistry's "Injurious Materials" limitations.

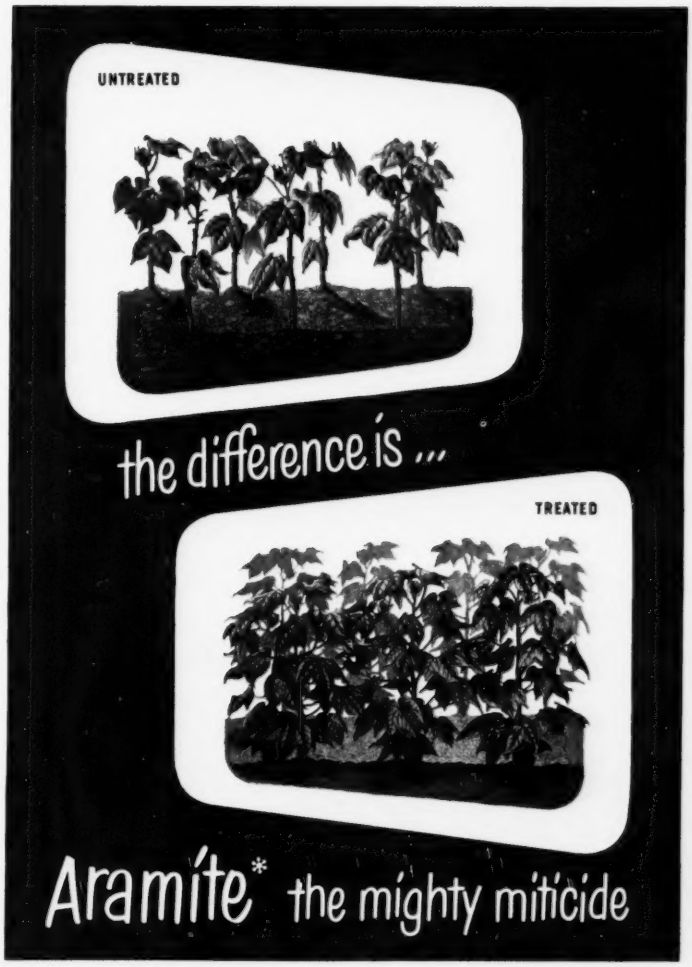
Aramite (88-R). This miticide has been only little more consistent in its control of several species of mites than some other miticides. Its longer residual effects is a great advantage over some others. Because this matrial has no fumigation effect, thorough under-leaf coverage is necessary to contact the mites. Dust and spray formulations applied by ground equipment should be directed onto the lower leaf surface. Aircraft applications of dust have given better control than aircraft spray applications of Aramite. Aircraft applications of Aramite have not been consistently good enough to recommend them. Excessive amounts of Aramite as either dust or spray will burn cotton foliage. Since the compatibility of Aramite with sulfur is questionable, they should not be applied together or within two weeks of each other.

Ovotran (K-6451). This is compatible with sulfur. It is effective on mite eggs but gives little or no control of adult mites which may soon infest new leaves. There is no Ovotran present on the new growth and therefore the eggs and mites survive. Applications of sprays and dusts at from 1-½ to 3 pounds per acre of the actual material have been equally good. If two dust applications of 10% Ovotran at 30#/A are made, the cost is high. Ovotran has not been as promising for satisfactory control of mites as Aramite and is only recommended as second best in the list of non-injurious materials which have been tried for mite control on cotton in California.

Sulfur. Sulfur is 15 to 20 per cent short of the usual supply. It has been recommended with other insecticides and miticides, except Aramite, for the control of mites on cotton in all of the cotton growing areas. It is difficult to obtain control of the two-spotted mite on cotton with sulfur. Many cotton growers prefer to use sulfur, which they apply when the mites first appear and repeat the applications at 10-day to 2-week intervals until control is obtained. With aircraft applications in late season 50#/A is often applied. If the temperatures reach about 90° F, or above, the results will be much better than when lower temperatures prevail. The tests for control of the Pacific and two-spotted mites with sulfur have shown the so-called gashouse, flotation and micronized types of sulfur somewhat more effective than the ordinary 325 mesh dusting sulfurs, which is probably due to a greater per cent of finer particles and better conditioning of these.

Note 2. Subterranean feeding habits of some cutworms, such as the black or greasy cutworm, *Agrotis ypsilon* (Rott.), require certain additional attention for control. If the ground is

(Continued on Page 61)



Controls Red Spider Mite most effectively at economic dosages.

Results: More top-quality cotton.

Advantages: Non-hazardous, low cost per acre, compatible with most commonly used insecticides and fungicides, harmless to mite-killing insects. *U. S. Pat. No. 2,529,494

Write for free Aramite Bulletin No. 2

UNITED STATES RUBBER COMPANY
Naugatuck Chemical Division, Naugatuck, Connecticut
producers of seed protectants, fungicides, miticides, insecticides:
Spergon, Phygon, Aramite, Synklor.

AERIAL PHOTO of the Midsouth Fair Grounds at Memphis, scene of the First Annual Midsouth Gin Machinery and Supply Exhibit to be held March 10-11-12. The exhibits will be housed in the Shelby County Building, shown almost in exact center of photo at the right (large building with tower at its front).

Ginners of Six States Have Eyes On Memphis and First Annual

Midsouth Gin Exhibit

■ THE CASINO and Shelby County Buildings on Memphis' Midsouth Fair grounds will be the scene of this first undertaking of its kind for the important Midsouth area on March 10-11-12.

IT WAS A LONG TIME coming, but now that it's here the ginners of the important Midsouth area of the Belt have something to be proud of this year and something to look forward to in the years to come.

• **More Than 2,000 Expected**—The first annual Midsouth Gin Machinery and Supply Exhibit, which it is expected will attract more than 2,000 from a six-state area, gets underway on Memphis' Midsouth Fair Grounds March 10. Running for three days, through March 12, the Exhibit will be held concurrently with the annual conventions of the Arkansas-Missouri Ginners' Association and the Tennessee Cotton Ginners' Association.

• **Bruton Is Chairman**—Chairman of the Exhibit is W. Kemper Bruton, Blytheville, Ark. Bruton is also executive vice-president of the Arkansas-Missouri association and the National Cotton Ginners' Association. He advises that the sale of exhibit spaces has already exceeded earlier expectations and that the show is an assured success.

• **Wide Range of Exhibits**—Included in the machinery and supplies to be exhibited are ginning machinery, power units, bagging, cotton planting seed, scales, bags, mechanical cotton pickers, insecticides, fertilizers, and many other things the ginner uses.

The Exhibit will have educational features stressing the need for better ginning and proper use of the many pieces of equipment in a gin.

• **Joint Sessions in Casino Building** — Joint business sessions of the Arkansas-Missouri and Tennessee ginners associations will take place in the Casino Building on the Fair Grounds. All ginners attending the three-day affair, no matter from which state they come, are invited to participate in these joint sessions.

• **Panel Discussion on Harvesting and Handling** — The first joint session is scheduled for Monday morning, March 10. It will open, with entertainment features to be announced, at 9:15 a.m. At 9:45 there will be a panel discussion of "Harvesting and Handling Cotton for Quality Spinning." Moderator will be Jack Criswell, educational specialist of the National Cotton Council, Memphis. Members of the panel will be J. M. Ragsdale, Columbia, Mo., Extension cotton specialist; Robert Sloan, Little Rock, Ark., Extension cotton specialist; E. F. Davis, RoEllen, Tenn., producer-ginner; A. L. Storey, Charleston, Mo., producer-ginner; Charles Willey, Wabbaseka, Ark., producer-ginner; and John Elting, of the Kendall Mills, Paw Creek, N. C.

• **Ralph S. Trigg to Speak** — Featured speaker at the opening session will be Ralph S. Trigg, Washington, deputy administrator of the Defense Production Administration. His address is slated to begin at 11:15 a.m.

The session will close at noon. Lunches will be available in the Casino Building.

• **Exhibits Open in Afternoon** — There will be no afternoon business session,

either on March 10 or 11, but the exhibits will be open in the Shelby County Building on the Fair Grounds from noon until 5:30 p.m.

• **Panel Discussion on Ginning and Packaging**—The second day's joint business session will begin with entertainment at 9:30 a.m., Tuesday, March 11. A second panel discussion, on "Ginning and Packaging Cotton for Quality Spinning," will begin at 9:45, with Dr. C. R. Sayre, Scott, Miss., as moderator. Dr. Sayre is president of the Delta & Pine Land Company and chairman of the National Cotton Council's production and marketing committee. Panel members are John E. Mitchell, president of John E. Mitchell Company, Dallas, manufacturers of ginning machinery; Charles M. Merkel, of the USDA Cotton Ginning Laboratory, Stoneville, Miss.; Vernon L. Moore, of the USDA Fiber Testing Laboratory at Stoneville; Alf M. Pendleton, USDA cotton ginning specialist, Dallas; and T. D. Truluck, of Deering-Milliken Mills, Union, S. C.

• **Robert C. Jackson Second Day Speaker**—Featured speaker at this session will be Robert C. Jackson, Washington, executive vice-president of the American Cotton Manufacturers Institute.

As on the opening day, lunch can be obtained in the Casino Building, with the exhibits open in the Shelby County Building until 5:30 p.m.

There will be no business sessions March 12, but the exhibits will be open from 8:00 a.m. until 1:00 p.m.

Headquarters of the Arkansas-Missouri Ginners' Association will be at the Peabody Hotel. The Claridge will be headquarters of the Tennessee association.

• **Association Entertainment Features and Business Sessions**—At 7:00 p.m., Monday, March 10, the two associations will give separate buffet suppers and hold business sessions, each at its respective hotel. On Tuesday evening, March 11, each association will give a cocktail party, also at the respective hotels, with separate banquets and floor shows to follow at 8 o'clock. Tickets for these entertainment features will be available at time of registration.

• **Association Officers**—J. P. Ross, Essex, Mo., is president of the Arkansas-Missouri association. W. Kemper Bruton is executive vice-president; and J. E. Teaford, Luxora, Ark., is vice-president. E. K. Boyd, Bolivar, heads the Tennessee association. E. F. Davis, RoEllen, is vice-president; and W. T. Pigott, Milan, is secretary-treasurer.

"1952 Feeding Practices" Continues to Draw Praise

The big little book that is a valuable deed to the public is the way that a user of the "1952 Feeding Practices" recently described this annual publication which the cottonseed crushing industry publishes through the NCPA Educational Service.

Leroy Beach of Millerview, Texas, wrote: "The publishing of this 'big little' book is a very valuable deed for the public and all who use the book."

Another recent comment was that of Duke A. Durkee, Bozeman, Mont.: "I can sincerely say that it is the most comprehensive and well written booklet on this subject that it has ever been my good fortune to read."

• Steep, erodible land can often be put to its best use by planting it in trees.

THE PROOF OF THE PUDDING is in the eating. Here, early season control paid off by giving a high yield (a bale to the acre) and three weeks earlier harvesting.

Atlanta Is Site

Georgia Ginners to Meet on March 10

■ Lt. Gov. Griffin of Georgia will be featured speaker. Walter H. Brown and Chas. A. Bennett will also address the convention. Forum discussion to be a feature of afternoon session.

FEATURED speaker at the annual convention of the Georgia Cotton Ginners' Association, to be held March 10 at the Henry Grady Hotel in Atlanta, will be the Hon. S. Marvin Griffin, Georgia's lieutenant governor. He will address the convention at 10:55 a.m.

Walter S. Brown, director of the Georgia Extension Service, Athens, will also address the convention at the morning session. His subject will be, "The Ginner's Responsibility in the Success of One Variety Cotton Production."

The afternoon session will open with a report by Association President E. J. Swint of Jonesboro. The new Hercules Powder Company colored film on cotton insect control will be shown following Swint's report. The next feature will be a talk by Chas. A. Bennett of the U.S. Cotton Ginning Laboratory at Stoneville, Miss.

Moderator at an open forum discussion of ginning problems will be Cecil E. Carroll, vice-president of the ginners' association. Among those appearing on the forum will be C. M. Beckham, Georgia Extension entomologist, Athens; E. C. Westbrook, Georgia Extension cotton specialist; and Chas. A. Bennett. Representatives of the Georgia Experiment Station, the National Cotton Council and the Gin Machinery Manufacturers Association are also expected to appear on the forum.

The business program of the convention will come to a close with committee reports and the election of officers.

The entertainment program will include a social hour from 6 to 7 p.m., with Georgia oil mills as hosts; the annual banquet at 7:30 p.m. in the Dixie Ballroom of the Henry Grady, and a floor show. Jack Gilchrist, farm news editor of The Atlanta Constitution, will be toastmaster at the banquet. The ladies attending the convention will be given prizes by Continental Gin Company, Atlanta; Lummus Cotton Gin Company, Columbus, Ga.; Cen-Tennial Cotton Gin Company, Columbus; The Murray Company, Atlanta; and the Georgia Cotton Ginners' Association.

A meeting of the officers and directors of the association will be held Sunday, March 9, at 5 p.m.

Georgia Conservation Meet

Governor Herman Talmadge, National Soil Conservation Service Chief R. M. Salter, President O. C. Aderhold of the University of Georgia, and a number of Georgia soil conservation experts are to be speakers on the Soil and Water Conservation Conference program at the College of Agriculture, Athens, Ga., April 9-10.

(Continued from Page 32)

and volatility of the oil and its aromatic content are the main factors involved in the undesirable foliage reaction.

Solvents which will dissolve the toxicant with a relatively low boiling range and aromatic content appear to be most desirable for use in emulsifiable concentrates. Emulsifiers and solvents should be tested for toxicity to the cotton plant, and their general suitability determined, before they are used in formulations.

In general, the mass median diameter of the spray droplets should range from 100 to 300 microns. Manufacturers' recommendations should be followed in regard to pressure for specific nozzle size to insure a proper spray pattern.

For treatment of seedling cotton with ground equipment in most areas, it is suggested that one nozzle per row be used to apply the spray, and as the cotton increases in size, the number of nozzles per row be increased up to three to obtain full coverage. If nozzles are kept at least 10 inches from the plant, better coverage will be obtained and danger of leaf burn will be minimized.

For use in ground equipment, it is essential that spray concentrates be diluted immediately prior to use with not to exceed an equal volume of water, and the diluted emulsion then added to the required volume of water. During the spray operation some type of agitation is essential in order to insure a uniform emulsion.

As a safety measure, it is recommended that the spray boom on ground equipment be located behind the operator.

For airplane spray application, it is suggested that from 1 to 2 gallons of spray containing the recommended amount of toxicant be applied per acre. It is essential to use some method of flagging or marking of swaths for best results in airplane spraying.

For stability in storage and to prevent breakdown of the folmulation when metal containers are used, the container should be lined with some material that will not react with or cause deterioration of the concentrate. It is undesirable to reuse metal containers for the packaging of emulsion concentrates. Used containers, especially 30- and 50-gallon drums, often have breaks in the lining which are hard or impossible to detect but which will cause a breakdown of the formulation by permitting it to come in contact with the metal. Containers on farms sometimes become contaminated with 2,4-D or 2,4,5-T. Such contamination cannot always be detected and reuse of contaminated containers might prove to be very hazardous to the processor as well as to the farmer.

It is desirable that the insecticides be prepared in such a way that they may be combined with each other to form a satisfactory emulsion. It is suggested that whenever possible the manufacturers prepare formulations in even multiples of the amounts of insecticide recommended per acre. The pound per gallon of each insecticide in the concentrate should be shown on the label.

Insecticides

The experimental data and the results of field tests presented at the conference showed that no particular insecticide gave results outstandingly superior to those of any other recommended insecticide or mixtures of materials when they were used according to the recommendations of the official entomologists and at the dosage, time, and frequency recommended. The most important factors in the effective use of insecticides for cotton insect control are the dosage, timing, frequency, and thoroughness of application.

• **Aldrin** — Aldrin received wide usage for cotton insect control during 1950 and 1951. In most cases, it will control the boll weevil, thrips the cotton fleahopper, the tarnished plant bug, the rapid plant bug, grasshoppers, and newly hatched cotton leafworms. It will not control the bollworm, the yellow-striped armyworm, certain species of cutworms, the cotton aphid or spider mites. Aldrin may increase spider mites and mixtures of aldrin and DDT may increase aphids. For boll weevils, aldrin should be applied at the rate of 0.25 to 0.75 pound per acre. Aldrin is effective as a dust or as a spray.

Aldrin is toxic by skin absorption, by inhalation, and by ingestion. It is recommended for use on cotton only where persons applying it are fully aware of the hazards and will follow the precautions prescribed by the manufacturers.

(See Hazards and Precautions in the Use of Insecticides.)

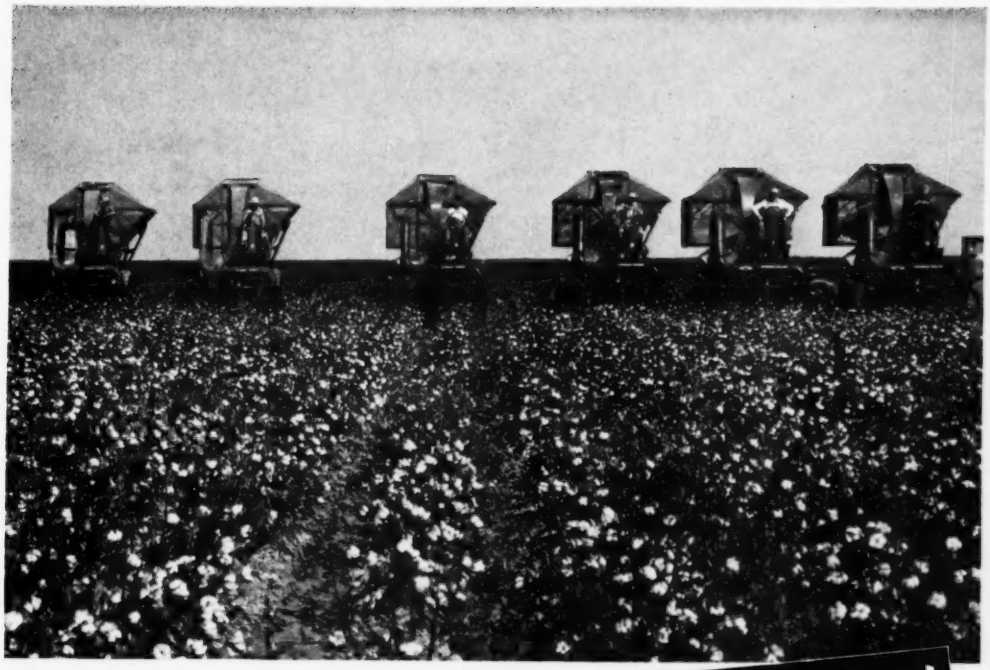
• **Benzene Hexachloride**—Benzene hexachloride will control the boll weevil, the cotton aphid, the tarnished plant bug, the rapid plant bug, the cotton leafworm, thrips, the southern green stink bug, the garden webworm, the fall armyworm, the cotton fleahopper, and grasshoppers. It will not control the bollworm, the yellow-striped armyworm, some species of cutworms, the pink bollworm, the salt-marsh caterpillar,

(Continued on Page 63)

Quotes From Our Authors:

"THIS (pink bollworm) problem is one that demands the highest degree of cooperation between farmers, entomologists, regulatory officials, and industry, if we are to prevent the pink bollworm from reaching its greatest destructive potential in the United States."

COTTON INSECTS got the crop . . . the farmer, the ginner, the oil miller got nothing.

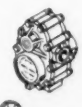


To Keep Pests from Getting First Pick...

Are you always ready to hit pests before they hit you? Three simple, inexpensive Myers attachments turn your tractor into an efficient, low cost cotton sprayer within an hour's notice . . . ready to kill pests in any weather that allows you to take your tractor into the fields.

The many cotton pests have different life cycles. They mature at different ages. They do their damage at different times. For *complete* pest control you should be ready to kill at *any* time.

One - Two - Three ...and you're off!



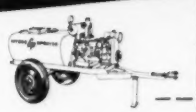
1. The Myers pump is self-priming, self-lubricating, and delivers from 1 to 5 gals. per minute at 100 lbs. pressure.

2. Three-in-one control valves for boom wings, center section and pressure are quickly mounted on your tractor within easy reach.

3. The Myers 2, 4, 6, or 8 row boom with row-fitting nozzle attachments applies spray close-in from all angles, and in controlled amounts.

More Buyers Buy Myers!

POWER SPRAYERS



A complete line of power sprayers—2-wheel, 4-wheel, and skid types for use with guns or booms. Pressures from 30 to 800 lbs.

Remember . . . this versatile Myers sprayer applies defoliants and weed killers too. A steel safety hinge allows boom to yield when it hits an obstruction. Wings fold for transport. Tension springs hold them in alignment when in operation.

Consult your Myers dealer for complete information, or fill out and mail coupon.

THE F. E. MYERS & BRO. CO.
212 Orange St., Ashland, Ohio

Please send: ☐ Bulletin on Tractor-Mounted Sprayer
☐ Catalog on Myers Spraying Equipment

Name_____

Address_____

Town_____

County_____ State_____

COTTON for breeding work is grown in pots in greenhouses at the Texas A. & M. College. This cotton fruited in January.

What lies in the seed of

Wild Cotton?

WILL THE SCIENTISTS find a type of cotton ideal for mechanical harvesting, or perhaps one that is resistant to insects? The answers to these and other questions, now being sought by researchers, could determine the future of the cotton industry.

By A. B. KENNERLY

SECRETS LOCKED UP for hundreds of centuries in 16 species of wild cotton are gradually being revealed in the cotton laboratories at Texas A. & M. College. It's a slow process. For 12 years the work has been in progress and what has been accomplished so far has been improved methods of research — and a few strains of cotton whose fiber is stronger than anything ever known in upland cotton before.

With this encouragement, cotton scientists are increasing their efforts to find what lies in the seed of wild cotton. An ideal type of cotton for mechanical harvesting? It may be possible. A cotton resistant to insects? There is some encouragement on this from British cotton scientists.

Until 1940 wild cottons were worthless to the plant breeder. When crossed with Asiatic or American cottons, the hybrids would not produce plants. They were as sterile as a mule and just as balky. Wild cottons, however, offered the best hope for improving American cotton. There are only two species of cultivated American cotton and two species of cultivated Asiatic, and these have just about been worked for everything they were worth. Many combinations had been tried time and again, and progressive cotton scientists pretty well agreed that new varieties carrying improved spinning qualities, varieties suitable for mechanical harvesting and varieties resistant to insects and disease would have to come from something besides our present cultivated varieties. They continued to struggle with the wild cotton.

Fortunately, in 1940 the drug colchicine provided the answer which unlocked the door to the cotton treasure chest. Wild cotton was crossed with Asiatic cotton and the resulting plant was treated with colchicine. The seed produced a fertile plant. This plant was successfully crossed with American cotton and the hybrid also proved to be fertile. Sixteen species of cotton were available for crossing instead of two!

Over the past decade the work of breeding these cottons has been in progress. Summer and winter, thousands of combinations are tried and discarded, trying to find something in this vast reservoir of characters in wild cotton which can be transferred and put to work for American farmers.

Some of the tests indicate that high yielding cotton plants may be found in these hybrids that have characters giving extra strong fibers. Spinning tests have shown that some of the strains are definitely superior in appearance of the yarn.

There is a possibility that a type of cotton more resistant to cold can be developed. Such a cotton would make it possible to plant early and yet avoid damage from early cold snaps and near-freezes which may set back the early cotton crop. This early cotton may also fruit early enough to avoid damage from insects. A remote possibility based on reports from British workers suggests that a strain may be developed to resist damage from the pink bollworm.

But it's going to take time. Along with the desirable characters, there are most always some undesirable characters which ride along when the good ones are being transferred from the wild cotton to American varieties. How to make the desirable characters feel at home in the strange surroundings and kick the unwanted guests gently out the back door is the problem of cotton breeders.

The big hope for cotton in the next few years lies in new and unusual combinations of characters which have been made available to plant breeders in such abundance. Only the surface has been scratched—the possibilities are unlimited. What improvements will show up in the opened bolls of tomorrow's experiments is anybody's guess.

Carolinas Ginners Re-elect McLaurin, Other Officers

For the second time in as many years bad weather cut into attendance at the Carolinas Ginners Association's annual convention at Bennettsville, S. C., on Feb. 26-27. Held to a mere 250 the first day, the attendance jumped to more than 600 for the final session.

J. F. McLaurin, Bennettsville, will again serve the association as president. Myres Tilghman, Dunn, N. C., and Frank M. Wannamaker, St. Matthews, S. C., were re-elected vice-presidents; and Louis G. McGill, Bennettsville, continues as executive secretary.

An excellent array of speakers discussed such subjects as the outlook for domestic consumption of cotton; modern cotton production methods, including weed control and insect control; the cotton export outlook; ginning rough harvested cotton; mechanization research; and prospects for a new long staple cotton for the Southeast.

The annual banquet Feb. 26 featured good food, pleasing entertainment, and an outstanding address by Clayton Rand of Gulfport, Miss.

Board of directors members named at the final session were President McLaurin, Vice-Presidents Tilghman and Wannamaker; Talley E. Smith, Rowesville, S. C.; O. L. Edwards, St. Charles, S. C.; D. T. McLees, Westminster, S. C.; J. M. Barr, Leesville, S. C.; Forest S. Crowder, Lattimore, N. C.; W. E. Ashcraft, Monroe, N. C.; Clyde E. Upchurch, Jr., Raeford, N. C.; J. W. Robbins, Scotland Neck, N. C.; Carl T. Hicks, Walstonburg, N. C.; and Wilfred R. Cato, Emporia, Va.

Mexican Labor Bill Gets SOME TEETH REMOVED In Action by the House

■ **AMENDMENT by House to throw out Senate's warrant provision puts measure into conference and delays final action.**

WASHINGTON, FEB. 27

By FRED BAILEY
Washington Representative
The Cotton Gin and Oil Mill Press

AN ENTIRELY unexpected House amendment to the Senate Kilgore Mexican border patrol bill this week threw the highly controversial measure into conference and a probably long delay in final action.

The amendment threw out the Senate provision which would permit issuance of "administrative" warrants by the Immigration Service for search and arrests in areas more than 25 miles from the Mexican-U.S. border. Instead, the House adopted a court warrant procedure.

Sources close to President Truman said the House bill, if passed by Congress, would "damned well be vetoed." The whole thing has become so involved that only a complete House retreat from its position would seem to make the bill safe from a veto.

• **Too Restrictive, White House Says**—The House version of the bill, passed by an overwhelming 162 to 10 vote, provides that the Attorney General of the U.S. or any of six other persons, all Immigration Service officials along the border, would have authority to apply for warrants in any "competent court." White House sources say that this is far too restrictive and would "virtually handcuff" the Immigration Service in trying to prevent entry of wetbacks.

Likewise, Justice Department attorneys say the language is such that there is considerable doubt as to whether the bill would give state courts authority to issue warrants. They say the language might restrict it to federal courts.

The bill retains the Senate provision permitting search and arrest by Immigration Service without a warrant within 25 miles of the border. In doing so the House rejected an amendment by Rep. John Phillips of California to restrict the distance to 5 miles.

It was known for some time that the Texas delegation in the House would put up a fight for elimination of the administrative warrant and the substitution of a court warrant, but observers here did not figure that they would have much of a chance of succeeding

The House judiciary committee had approved the Kilgore bill by a vote of 13 to 4 and it was given a green light by the rules committee. Most observers thought that adoption of the Kilgore bill was a cinch. They expected the Texas delegation to go down fighting.

All of the interested farm groups, after weeks of discussions with Administration agencies involved had agreed to a compromise that included the administrative warrant. They were not happy about it, but figured that the President meant business when he was quoted as saying he would veto the court warrant procedure.

• **Action, And Lots of It** — Then, on Wednesday, things began to happen with explosive and startling rapidity. The court warant amendment was offered by an entirely unexpected source, Rep. Francis Walter, Pennsylvania, chairman of the judiciary subcommittee which had considered the Kilgore bill and approved the administrative warrant. It was supported by Rep. Emanuel Celler, New York, an Administration loyalist.

Walter and Celler based the argument on the doubtful constitutionality of the administrative warrant. The Texas delegation, apparently knowing in advance what the strategy was, sat back and let Walter and Celler carry the ball. They knew that Rep. Sam Rayburn of Texas had been active behind the scenes in their behalf and so they pretty well kept out of it.

Despite previous strong Administration statements in opposition to the court warrant procedure, Floor Leader John McCormack did not rise to defend the Administration position. In fact there seemed very little support for the administrative warant procedure.

• **No "Deal," Administration Insists** — All sorts of rumors attempting to explain the sudden turn of affairs flew around the Capitol today. Some insisted that a "deal" had been made, involving political considerations, between the Administration and leaders of the Texas delegation. This was flatly denied by both sides.

One high Administration source said that "you will find out whether a deal has been made if that sort of a bill comes to the White House. The President will damned well veto it."

From other sources, however, a veto appeared less certain. It was indicated in reliable quarters that if the House and Senate compromise on a provision which would give the attorney general unlimited authority to delegate to Immigration Service the power to apply for warrants, the President might not veto the bill. This, admittedly, was speculation.

• **Agreement Will Be Delayed** — Only one thing seems certain in the present confused state of affairs. The negotiations for extension of the Mexican farm labor agreement will be delayed until Congress finally passes a bill which the President can sign. The agreement has been extended to May 11, but Mr. Truman says he will not ask for a further extension until Congress adopts a "satisfactory" bill for effective patrol of the border. That may take some time.

TIMELY TIPS
On Livestock Feeding

• **Texans Don't Always Brag** — Texas dairymen must improve their herds and their feeding practices before they can produce milk as efficiently as the average dairyman in the nation, says Texas Extension Dairyman A. M. Meekma. Dairy Herd Improvement Association records show that in 1950 Texas dairymen spent $151 on feed for each cow to produce 6,781 pounds of milk. The U.S. average was only $147 spent on feed for each cow to produce 9,172 pounds of milk.

Dairymen throughout the cotton-growing states need to breed better cows and feed them more economically and efficiently. One of the best ways to breed cows is to use the services of an artificial insemination association and keep heifers from the best producing cows.

The quickest way to increase dairy profits is to feed more efficiently and economically. Develop and use pastures to the fullest extent. Harvest and feed plenty of silage, hay and cottonseed hulls. Always keep the ration balanced for protein by adjusting the amount of cottonseed meal according to the amount and quality of protein in the pasture or roughage.

• **But, Now Arizona is Bragging (rightfully, we think)**—The "Arizona Farmer" magazine shows a picture of some top finished fat steers from an Arizona feedlot and the editor made the following modest comment about the Arizona bred and fed steers, "Good Arizona-raised chopped hay, grain, cottonseed meal and silage have put the kind of heft on the steers that cattle buyers look for, and it proves once and for all that we don't need any 'fancy imported concentrates' to produce excellent quality fat steers."

• **Protein for Winter Grazing**—Dr. T. J. Cunha, University of Florida animal husbandry head, warns that during the winter grass is low in protein and the protein it does contain is less available to the cattle. He says, "Protein supplementation increases the appetite of the cattle, causing them to graze even more. Moreover, grass they eat is more efficiently utilized because of the extra protein which they are getting."

• **Don't Stop Supplemental Feeding Too Soon**—California Farm Adviser Walter Johnson says that winter rains leach feed value of dry forage. They may start pasture growth earlier but the young green feed will be mostly water with no strength in it until it gets established.

He says, "A good protein supplement will keep your stock in good, thrifty condition until the new feed gets some strength into it. Also with the calving and lambing seasons starting, some extra feed will bring the cows and ewes into higher milk production."

Farmers Reminded to Use Certified Planting Seed

Farmers will need to use "every trick in the bag" to meet the production goals which have been set for 1952. The planting season is approaching in most sections of Texas and farmers are reminded by L. C. Coffey, associate agronomist for the Texas Agricultural Extension Service, that only top quality seed should be used for seeding the 1952 crops.

He points out that certified seed are usually the best seed of a particular variety available. These seed come from fields that have been inspected during the growing season, have been properly handled at harvest time, cleaned, tested for purity and germination, and properly stored.

The blue tags attached to each sack of certified seed carry accurate information about the quality of the planting seed. These tags are issued by the State Department of Agriculture for use on seed which have met certain high standards of purity and germination. In 1951, blue tags were issued for 91 varieties of 15 different crops grown in Texas.

Although certified seed may cost slightly more than other seed, the added expense is offset by the assurance of purity, higher percentage of germination and varieties that are adapted to Texas conditions, says Coffey. Seed of questionable germination and purity may not be cheap at any price.

Coffey urges farmers to get the seed that will be needed for this year's crops now while supplies are adequate. Last minute seed shoppers may find the stocks depleted and thus will be forced to plant whatever is available. The use of poor quality planting seed may prove to be a year-long handicap in meeting production goals, Coffey warns.

'52 Maid of Cotton Visits Southern Laboratory

PATRICIA ANN MULLARKEY, 1952 Maid of Cotton, discussed many phases of cotton utilization research with staff members of the Southern Regional Research Laboratory during her visit to New Orleans on Feb. 14. Pictured, left to right, are Miss Janice Poynot, a member of the Textile Testing Section; Miss Mullarkey, holding a dresser scarf that looks like linen but is made of chemically treated cotton: Miss Constance Fleming, a member of the Laboratory's Cotton Chemical Processing Division; and Miss Ines V. deGruy of the Microscopical Properties Section.

• When you see one rat in your barn you can be sure that he is backed up by 20 others you do not see, according to rodent control experts.

SECURITY BRAND

COTTON INSECTICIDES

LABORATORY TESTED — FIELD TESTED — FARM PROVED QUALITY MATERIALS FOR COTTON INSECT CONTROL

DUSTS

CALCIUM ARSENATE * DIELDRIN

BHC-DDT * TOXAPHENE * ALDRIN-DDT

3-5-40 20-40 2½-5-40

3-5-0 20-0 2½-5-0

SPRAYS

TOXAPHENE * BHC-DDT * ALDRIN

Tox-Sol-DDT Drin-Sol-DDT

Sox-Sol Hex-Sol Drin-Sol

DIELDRIN * DIELDRIN-DDT

MOPPING

MOP-N-MIX - For Low Cost Early Poisoning

ALWAYS BUY SECURITY BRAND QUALITY MATERIALS THAT BRING REPEAT SALES FROM SATISFIED CUSTOMERS

Prepare for the '52 Crop — Buy Now!!

WOOLFOLK CHEMICAL WORKS, LTD.

Manufacturers Fort Valley, Ga.

A Crop for You in '52 — Bugs Don't Wait, Why Should You!

Cotton States Chemical Co.

INCORPORATED

Chemicals for Agriculture

Service — Quality

P. O. Box 3186

WEST MONROE Phone 3-5501 LOUISIANA

Special Report

Council Makes Study Of Cotton Linters

■ Growth of industry traced for past 70 years. Chemical firms are biggest linters users.

Cotton linters, the tiny fibers or fuzz that clings to cottonseed after ginning, go into products ranging from sausage casings to surgical gauzes that use up more than 1,500,000 bales annually.

In a special report "Cotton Linters," just published, the National Cotton Council traces the growth of the linters industry which has expanded steadily over the past 70 years. Chemical firms are the biggest users of linters accounting for about 60 percent of total consumption, the report discloses. The batting, padding, and felting trade ranks as the second largest customer with the absorbent cotton industry in third position.

Linters are removed from cottonseed by forcing the seed into contact with sharp saws revolving at high speeds through closely spaced openings. The saws separate the linters by catching the short fibers and pulling them between ribs set so closely together that the seed cannot pass through. From the saws, linters go through a cleaning process and are then collected for packing in 600 pound bales.

The Council survey of the production, distribution and consumption of linters is based on first-hand reports by dealers, manufacturers, and trade associations as well as on an exhaustive appraisal of all available published information.

Other highlights of the Council report are:

Rayon producers consume more linters, in the form of cellulose, than all other chemical users combined with volume still increasing. Linters in plastics, nitro-cellulose products, paper, and cellulose ether products are the next biggest chemical consumers. In 1949 a record volume of 968,000 bales of linters were used by the chemical industry.

In batting, padding, and felting, cotton linters compete with cotton waste, foam rubber, sisal, wood pulp, hair, and miscellaneous materials, with price being a deciding factor in most uses. Although linters have lost ground to some competitors total linters consumption has gone up in automobile and furniture uses, the biggest outlets for felting grades. Sharp gains were also scored in mattress and bedding categories. Cotton waste nosed out linters in absorbent cotton in recent years. But an average of about 10,000 bales annually of Grade 1 linters still go into this use.

Paper production may provide a big potential market outlet for linters. Mill-run linters in particular are regarded as being well suited for fine bond production because they are easily processed and converted into paper pulp. Trade experts feel now is the time to promote linters for paper pulp because of the difficulties being encountered with scraps and cuttings containing synthetic fibers not suitable for pulp making.

The competitive position of cotton linters in all major outlets could be strengthened by developing more effective methods for removing foreign matter from the raw stock. Getting rid of a higher percentage of trash would directly affect processing costs and thus put linters in a better position pricewise. The problem of foreign matter poses a serious problem for the chemical industry, the report states, because refined linters must be filtered free of impurities before going to consumers. Trash left in the pulp can cause sopts or defects in films, lacquers, plastics and rayon products.

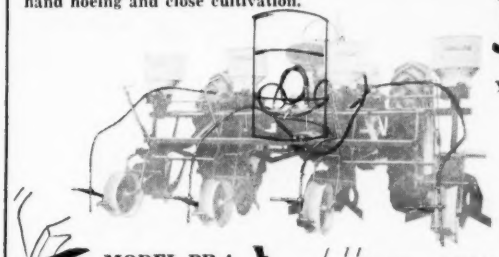
Copies of the Cotton Council's report "Cotton Linters" may be obtained by writing to the National Cotton Council, P. O. Box 18, Memphis 1, Tenn.

Britain to Buy Cotton from Anglo-Egyptian Sudan

A London newspaper stated Jan. 25 that the British Raw Cotton Commission had negotiated with the Sudan Gezira Board and the Sudan Government to purchase 60 percent of the 1951-52 cotton crop in the Anglo-Egyptian Sudan. Prices agreed upon were on the basis of levels prevailing in Egypt and the Sudan during the first few weeks of January 1952 for part of the purchases, while the balance will be based on the average of certain quotations on the Alexandria market during the first 3 months of 1952.

Kill Weeds in Cotton with the PRE-EMERGENCE Broyhill SPRAYER

Sprays new type weed killer on the row as cotton is planted. Kill the weeds before they start. Eliminates hand hoeing and close cultivation.

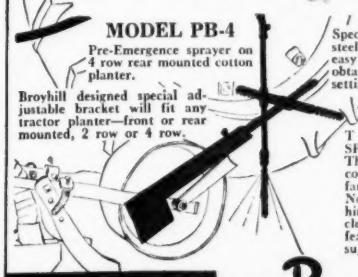


MODEL PB-4

Pre-Emergence sprayer on 4 row rear mounted cotton planter.

Broyhill designed special adjustable bracket will fit any tractor planter—front or rear mounted, 2 row or 4 row.

Special 8-way adjustable steel bracket makes it easy for operator to obtain desired nozzle setting.



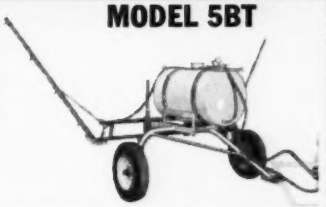
YOUR SAVINGS IN WEED CONTROL ON ONLY 5 ACRES OF COTTON WILL EASILY PAY FOR THIS LOW COST, EFFICIENT BROYHILL SPRAYER. It's another BIG STEP FORWARD in mechanized cotton farming. BROYHILL is proud to lead the field with the EXCLUSIVE FEATURES of this Pre-Emergence Sprayer. Extra sturdy, high quality parts throughout, including high grade hycar hose and BROYHILL processed STAINALIZED steel drop extensions, eliminate corrosion trouble.

Available in three different kit forms—2-row, 4-row, and pump kits. Write at once for your local source of supply, or for more information.

Outstanding Trailer Sprayer Value

MODEL 5BT

THE MOST POPULAR TRAILER SPRAYER IN THE COTTON BELT. The HIGH QUALITY CONSTRUCTION, combined with LOW COST, appeals to farmers everywhere. Non-corrosive spray boom, triple acting hinges, accurate control unit, and high clearance axles are just a few of the many features. Write for your local source of supply, or more information.



WRITE DIRECT THE Broyhill COMPANY *Manufacturers of Farm Equipment* DAKOTA CITY, NEBRASKA

At Annual Convention

Ice and Style Shows For Texas Ginners

■ Members and their families will be guests of machinery and supply men at all entertainment features. Dates of convention are March 31, April 1 and 2.

Ginners, members of their families, and others who attend the thirty-ninth annual convention of the Texas Cotton Ginners' Association at Dallas on March 31, April 1 and 2 will see the largest display ever of gin machinery, power units, petroleum products, bagging, insecticides, cotton planting seed, and numerous other supplies necessary for the successful and profitable operation of a cotton gin.

All exhibits will be in the Agriculture Building on the grounds of the State Fair of Texas. The entire 50,000 square feet of floor space in this building will be utilized. It can be quickly and comfortably heated in the event of cold weather. The busines sessions of the convention will be held in the well-lighted and comfortable Science Building, just east of the exhibit buildings. It can also be heated if necessary. There will be a restaurant in the Science Building serving excellent luncheons, cafeteria style, for the convenience of those who attend the convention.

• **Style Show** — For the past several years the annual style show has been one of the biggest attractions of the convention's entertainment program. On the afternoon of April 1, Volk Bros. Company, one of Dallas' finest department stores, will stage a cotton style show that will be of special interest to the women attending the convention. Last year the women—and the men, too —literally overflowed the vast space where the style show was held. Additional details about the show will be furnished later.

• **Ice Show** — Instead of providing a stage show, as is usually done on the second night of the convention, this year those attending the big convention will be guests at an elaborate Ice Show to be staged in the Ice Arena, located east of the Agriculture Building. This will be one of the most beautiful shows of its kind ever to be seen in Dallas. More than 125 talented and beautifully costumed performers will be in the cast. Admittance to the Ice Show will be by badge, with no seats reserved. It will be a matter of first come, first served, but since there are 5,000 seats in the Arena no one should be turned away.

The ginners and their families will be the guests of the Gin Machinery & Supply Association, Inc., at all entertainment features of the convention. The firms and individuals who buy exhibit space and contribute to the entertainment fund make up the membership of this association.

There are more hotel rooms in Dallas than a year ago, but the big attendance expected at the convention is still going to tax the capacity of the hotels. All who expect to attend should immediately write the hotel of their choice for reservations. Be sure to state that you are going to attend the Texas ginners' convention, since the hotels are setting aside rooms for convention visitors.

Inquiries regarding exhibits should be addressed to the Gin Machinery & Supply Association, Inc., P. O. Box 444, Dallas 1.

Missouri Cotton Producers Plan 5-Point Program

The Missouri Cotton Producers Association has announced a five-point legislative program designed to insure farmers against disaster should they meet 1952 production goals set by USDA. The five points given briefly are:

1. Revise the parity formula by a change in the base period and the inclusion of farm labor costs.

2. Shift the parity base from middling ⅞ inch to low middling ⅞ inch. Rough harvesting methods and low grades are inevitable with high production.

3. Stockpile of surpluses in excess of domestic and foreign demands in years when production goals are in effect.

4. Ban export controls when production approximates 85% of production goals.

5. Change the period for fixing loan differentials from the previous year to the average of the previous five years.

President S. Crews Reynolds stated that all of the Mid-South cotton producing states, Arkansas, Louisiana, Mississippi, Missouri, and Tennessee, have agreed to full support of the five-point program. He also said that asking for price supports on cotton above 90 percent of parity would be out of line with support levels set for other commodities. However, the adjustments called for in the five-point program are necessary to bring about equality in parity between cotton and the other basic commodities.

Dr. P. V. Cardon Heads USDA Graduate School

The appointment of Dr. P. V. Cardon as director of the graduate school of USDA has been announced by T. Roy Reid, chairman of the school's general administration board. Dr. Cardon will fill the post of director during the absence of Dr. Lewis H. Rohrbaugh, who is on a 2-year assignment as Point IV director for Iraq.

Dr. Cardon joined the graduate school staff as assistant director on a part-time basis, Feb. 1, following his retirement as administrator of the Agricultural Research Administration. Dr. O. B. Conaway, Jr., former assistant to the director, has been named assistant director.

CG&OMPress Photo.

Will Be in Charge of Murray's New Fresno Branch

THE MURRAY COMPANY of Texas, Inc., announced this week the appointment of R. D. Day as manager of its new branch at Fresno, Calif., and C. K. Cartwright as assistant manager. Day, right above, is shown with Cartwright studying plans for the new Fresno building. The branch will officially open March 16, with temporary quarters in the building formerly occupied by Ginners Supply Company, whose stock Murray has purchased. Day and Cartwright have been with The Murray Company since 1937 and have been specially trained in the installation, servicing and operation of Murray equipment and in branch office management. Day has been assistant manager of Murray's Memphis branch and Cartwright has been in charge of the Murray office at El Paso. The new Fresno branch will serve all of California and Arizona and have complete installation and servicing facilities.

Tops '50 by 2 Billions

'51 Net Farm Income Near 15 Billions

■ Misses post-war high of 1947 by 2 billions, but average income per capita last year was a record — due to continued decline in number of people living on farms.

According to preliminary BAE-USDA estimates, U.S. farm operators realized a total net income of 14.9 billion dollars in 1951. This was 2 billion dollars, or 17 percent, above the postwar low of 1950, but 2 billion less than the postwar high of 1947. Total nonfarm income, on the other hand, set another new record in 1951 which was 12 percent above 1950 and 37 percent above 1947.

Prices paid by farmers for commodities and services used in family living and maintenance averaged 9 percent higher in 1951 than in 1950, offsetting about half of the increase in farmers' dollar incomes. In terms of purchasing power, farmers' realized net income in 1951 was 8 percent above 1950 and about the same as in 1949; but it was 23 percent less than in 1947 and lower than in any year from 1942 through 1948.

The realized net income of farm operators is obtained by subtracting their total expenses of production from gross farm income. The latter includes the value of farm products sold or used in the farm home during the year, plus government payments to farmers and the rental value of farm dwellings. Each element of gross income was higher in 1951 than in 1950, and the total was up 14 percent to 37.4 billion dollars. Farm production expenses amounted to 22.5 billion dollars, 12 percent more than in 1950. These expenses cover purchased feed and livestock, fertilizer, hired labor, and other operating expenses, plus rent, interest, taxes, and other overhead costs. All were higher in 1951.

Neither gross income nor realized net income includes the value of any increases or decreases during the year in farm inventories of crops and livestock. Inventory changes are excluded so as to provide a measure of the income actually "realized" and available for farm family living and other nonfarm expenditures during the given year. Quantities of crops and numbers of livestock on farms at the end of 1951 were generally larger than at the beginning of the year. The net increase in inventories was valued at a record 1.6 billion dollars, with cattle accounting for two-thirds of the total. However, these additions to farmers' inventories were valued at year-end prices, which may or may not prevail when the commodities are actually sold.

The wages received by hired farm workers are a business expense to farm operators, but they are income to the workers themselves. Farm wages of laborers living on farms were about 2.2 billion dollars in 1951, or 9 percent more than in 1950. The increase was due to higher wage rates, as the number of hired workers declined slightly.

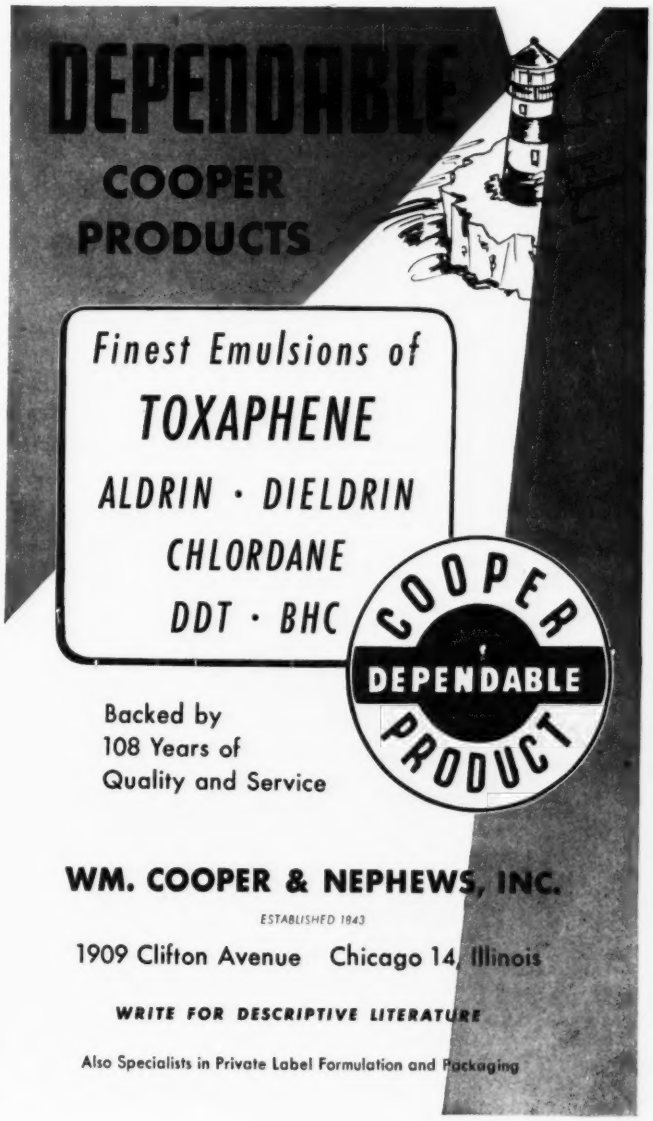
Net income of the farm population from farming was 18.8 billion dollars in 1951. This total includes the realized net income of farm operators, the net change in their inventories, and the wages received by farm laborers living on farms. Income from nonfarm sources added 5 billion dollars more, bringing the total income of the farm population from all sources to 23.8 billion dollars. This was 18 percent more than in 1950, but not quite up to the 1948 peak.

Because of a continued decline in the number of people living on farms, their average income per capita reached a new high in 1951, even though their total income did not. Income per person in the farm population was $1,020 in 1951, 7 percent above the previous high in 1948. Income per person in the nonfarm population was $1,707, or 13 percent above 1948. Per capita farm income from all sources was 60 percent as large as the nonfarm average in 1951, 63 percent in 1948.

Michigan Legislators Defeat Bill Allowing Margarine Use

A bill that would have permitted the use of margarine in Michigan state institutions was defeated by the lower branch of the State Legislature on Feb. 12 by a vote of 21 to 57.

Rural legislators opposed the measure on the grounds that it would penalize the dairy industry. Proponents said it would save the state at least $300,000 a year and not reduce the quality of diets at the institutions.



Neither fire nor flood, vinegar or blood, was able to stem the march of that bad hombre . . .

Anthonomus Grandis

FANCY NAME, Anthonomus Grandis—but to the cotton farmer he's plain Mr. Boll Weevil, a rampaging hombre that annually takes a big cut out of the cotton crop.

■ THIS PEST of cotton—known far and wide as the boll weevil—came uninvited into Texas from Mexico before the turn of the century. Every conceivable weapon was used against it, but it resisted them all and had fought its way to the easternmost edge of the Belt by 1921.

By BILL FOREMAN

ANTHONOMUS GRANDIS is a bad hombre. He probably has caused cotton farmers more sleepless nights than taxes, Johnson grass, mortgages and rheumatism combined.

And since anthonomus—better known as the boll weevil—crossed the Rio Grande back in the 1890's and came into this country, methods of combating him have ranged from picking him off the plant by hand to experiments with electronic devices designed to repel him.

History tells us that the weevil was discovered near Brownsville, Texas, in 1892. And from that time on, neither fire nor flood, vinegar or blood, smoke or molasses could stem his steady march across the Belt all the way to North Carolina, where he settled down in 1921.

Texans, who used Bowie knives at the Alamo, and chased Villa back home with Springfields, probably first fought anthonomus with their hands. The practice of picking adult weevils off the plant by hand in the spring was resorted to as an early method of control, as was gathering the infested squares later in the season. But some cotton farmers soon decided, and with good reason, that there were not enough folks even in Texas to successfully control the weevil in this fashion. After all, folks just don't reproduce as fast as anthonomus. The offspring of a single pair of boll weevils amount to millions in a season.

Some fellow who probably got an aching back and nervous prostration from picking boll weevils easily could have been the first man to have thought up the idea of mechanizing this operation. Anyway, bug catching machines made their appearance, forerunners of many such devices that have been tried from time to time. These knocked the weevils off by agitating the cotton plant mechanically or with a blast of air and the insects then were sucked or otherwise drawn into a receptacle from which they might be destroyed. Some shook the cotton plant so badly that it was damaged. All gathered beneficial insects as well as the weevil. Use of bug catching machines has never become general.

Somebody else figured that since most insects are attracted to light that the boll weevil might fall for such a trap. Lights were placed in cottonfields to attract the pest to a poisoned feast. Grasshoppers and moths, beetles and butterflies winged over to their doom but Ole Villain Weevil couldn't be bothered. He quietly continued to munch his squares.

BILL FOREMAN is with the Office of Public Relations, National Cotton Council, Memphis.

Flies and honeybees have a sweet tooth. That set somebody to thinking maybe honey or similar sweet substances could be poisoned to tempt the boll weevil to a fatal dinner. Some did have slight attraction but a job just as effective could be accomplished by applying the poison alone.

In South Carolina, particularly, the practice of applying a mixture of cal-

cium arsenate and molasses with a homemade mop or brush became popular. The molasses helped make the poison stick to the plant and weevils were killed. The swab and bucket, however, gave way to the use of calcium arsenate dust alone.

One Arkansas farmer came out with a "cotton smoker" which he said killed boll weevils and bollworms after it had been used in his cottonfield. The machine emitted a cloud of smoke containing guaiacol-phyrol, petroleum lubricants and sulphur.

Offensive odors apparently are not nearly so bothersome to the boll weevil as to the farmer, who has used all sorts of chemicals, fumigants, etc., in the hope of driving the pest away. Efforts along this line have met with little success. Castor bean plants, tobacco, and pepperplants at times have been mentioned as boll weevil repellants but have not been proved effective.

Another cagey trick is the planting of trap plots or trap rows of cotton to attract the boll weevil early in the spring where he may be greeted with a poison barrage before he can move in on the main crop. The writer asked a couple of entomologists about this method of control. They just grinned and started talking about something else. Then a study of pest control recommenations for the various states over the past four years failed to show where the practice was advocated.

There are natural forces, however, which even the boll weevil can't stand and the cotton farmer can be thankful that these, over the years, have kept the pest from being an even worse menace. Extremely cold weather takes its toll of weevils during the winter, while hot, dry weather in the summer remarkably restricts their activity.

Then too, a number of insects and parasites give anthonomus a hard time. There are parasites which deposit eggs on the weevil larvae or pupae in the cotton square and their young feed on the body of the immature weevil, finally killing it. Several different kinds of ants feed on the weevil and birds also find the cotton bandit to their liking.

Predatory parasites are a valuable means of natural control, not only of the boll weevil but other cotton pests as well. One of the most potent of the cotton farmer's allies is the ladybug which preys on the cotton aphid. In some cases where aphids have been particularly numerous, farmers have brought ladybugs into the cottonfield by the bucketful and released them.

Dr. H. G. Johnston, head of the Entomology Department, Texas A. & M. College, pointed out at the fifth annual Cotton Insect Control Conference in Memphis in December, that a method of killing harmful pests without destroying beneficial insects is one of the primary targets of research in entomology.

"Theoretically," he said, "an ideal solution is development of selective insecticides." Such an insecticide, he pointed out, has been developed in the field of systemic insecticides. Octamethyl pyrophosphoramide (and that ought to be enough to kill anything), when applied to the cotton plants either in the soil or as a spray on the foliage, is absorbed into the plant tissues. Aphids and red spiders eating cotton thus treated have been killed. Since beneficial insects do not feed on the plant they are not affected by the absorbed insecticides.

Hundreds of different poisons have been tried against the boll weevil. Quite a few have been found effective but in killing the weevil they also have knocked out beneficial predators, thus permitting a buildup of pests such as aphids and spider mites. A single all-purpose insecticide which effectively and economically kills all cotton pests is yet to be developed.

By mixing weevil killing poisons with other pesticides, however, insecticides manufacturers have developed formulas which will control effectively nearly all the pests which damage cotton. Such mixtures now are in common use and farmers who apply them as recommended are achieving better cotton insect control than ever before in history.

A report at the fifth annual Cotton Insect Control Conference in Memphis in December noted that the weevil may be controlled with benzene hexachloride, calcium arsenate, toxaphene, aldrin, heptachlor, or dieldrin.

Different insecticides and combinations are recommended in different areas. Where it is necessary to control other pests such as aphids, spider mites, bollworms, etc., simultaneously with the boll weevil, cotton farmers are advised to use mixtures containing other poisons along with the one included primarily for the weevil. A common example is "3-5-40," a mixture containing BHC to knock out the weevil, and DDT and sulphur for other pests.

Methods of applying insecticides have progressed along with the mechanization of cotton production. In the early days of cotton insect control, farmers trudged down the row with the poison in an open mesh bag which allowed the material to escape in the form of dust. Others used buckets with holes in the bottom through which the dust was sifted onto the plant. Then two sacks of poison were slung over the back of a mule so that dust would trail from each side to cover two rows of cotton at once.

Later, a one-row duster with a blower activated by a hand crank was developed. This could be slung over the farmer's shoulder. This system of dusting finally evolved into a mule-drawn machine with booms and nozzles to cover several rows, and finally into the tractor rigs in use today. Then dusters were mounted on airplanes. With planes, poison can be applied to as many as 1500 acres in a single day.

Two experimental methods of applying dust, neither of which have been proved on a wide scale in the cottonfield, recently have received mention in bulletins and magazines.

First, is an electrostatic method of crop dusting developed at Michigan State College. The insecticide dust is charged with electricity by a wire extending from a generator on the tractor to the dust discharge nozzle. Opposite electrical charges attract, so the dust particles jump onto the plant where they cling. Leaves and stems are coated. Better coverage, more dust on the plant, and saving of materials are claimed for this method of application.

Another system for charging dust is called the "supersonic method." Particles of dust are shot out of a jet-like nozzle at extremely high speed—at a rate which the inventor says is sufficient to charge each dust particle with

In '52: Save the Bolls – Produce the Bales

ROOT ROT, bacterial blight, or angular leaf spot, and other plant diseases must be prevented if the farmer is to make a profit.

15,000 volts. This causes the dust to cling to the plant.

With development of organic insecticides during and after World War II, entomologists and other scientists began experimenting with application of these materials in spray form. Now it is the consensus of Cotton Belt entolomogists that sprays for cotton insect control are equally effective as dusts. Sprays, in addition, can be applied at any time of the day with either ground or airborne equipment.

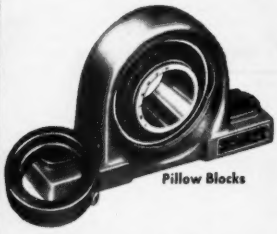
Entomologists insist that regularity, intervals and periods at which poisons are applied, and the manner in which they are dusted or sprayed, all are as important or more so than the type of insecticides used. Farmers, in all cases, are urged to consult their county agents or other authoritative agricultural workers for information on when to poison, how much and what type material to use, and frequency with which it should be applied.

One of the most novel ideas yet to be advanced for repelling pests was the "electronic" method tried out last season. This system, called "hemeotronics" by its promoter, is supposed to work on fields as far as 200 miles away. Its inventors say that all that is required is an aerial photo of the acreage to be treated and a small amount of insecticides. This is used with a machine resembling a radio set, which, its backers say, tunes in on the frequency of the plant and the poison with the result that pests are repelled. To date there have been no unbiased experiments proving effectiveness of the idea.

A news story describing tests of such a machine in the High Plains area of Texas quoted its agent as explaining the equipment works by changing the "magnetic aura" of cotton plants so that insects, who "feel their way by their antenna," think the cotton an inedible mass of eucalyptus.

Of all the weevil killing methods suggested since the pest first came to this country, the most certain if not the quickest means of control, was offered cotton farmers many years ago. An advertisement promised a sure boll weevil killer for only a dollar. For his dollar the purchaser received a package containing two wooden blocks, one marked "A" and the other "B". The instructions: Lay boll weevil on Block "A" and strike swiftly and sharply downward with block "B."

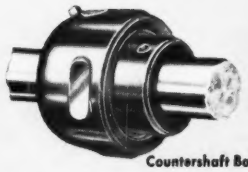
Easiest of all to install FAFNIR BALL BEARING POWER TRANSMISSION UNITS


Pillow Blocks


Flange Cartridges

because they have this

WIDE INNER RING BEARING WITH SELF LOCKING COLLAR


Countershaft Box


Cylindrical Cartridges

The reason why you'll find so many Fafnir Power Transmission Units on mills and gins is that they're equipped with Fafnir Wide Inner Ring Ball Bearings and self-locking collars. This Fafnir development eliminates shouldering, lock nuts and adapters. Made to inch dimensions to fit standard shafting, they slide right into place. Efficient seals and shields are provided to meet the toughest conditions.

For every Gin or Oil Mill application, on original equipment or replacement, you can count on the right Fafnir Ball Bearing Unit. They're made for saw, brush, distributor and idler shafts . . . linters, gins, attrition mills, presses, motors, fans, conveyors, lineshafts and countershafts. Records prove . . . easier installation, easier starting, long lasting, substantial power savings, a minimum of maintenance and lubrication. Write for literature. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR
BALL BEARINGS
MOST COMPLETE LINE IN AMERICA

Texas Studies Control of Spider Mites on Cotton

Several chemical compounds will give good control of spider mites on cotton. This was shown in tests conducted at College Station, Texas, in 1951.

Dr. J. C. Gaines, entomologist with the Texas Agricultural Experiment Station, evaulated aramite, ovotran, sulphenone, sulphur compound 923, TEPP, parathion, phosphorous compound 4049, EPN and sulphur dust for mite control.

Previous work by the Experiment Station has shown that sulphur and parathion dusts are effective for mite control. However, sulphur dust cannot be mixed with emulsion sprays.

Of the sulphur compounds tested, aramite proved most poisonous to spider mites. Four-tenths of a pound of aramite per acre gave as good control of mites as two pounds of ovotran, two pounds of sulphenone, two pounds of compound 923 or 15 pounds of sulphur dust.

Dr. Gaines reports that the sulphur compounds were effective for six or seven days. None of the compounds gave complete or "knock out" control of the mites.

The phosphorous compounds—parathion, compound 4049, TEPP and EPN—gave good control at about one-fourth of a pound per acre. The residual effect of TEPP was inferior to that of the other compounds.

These mite-killers proved effective whether applied by ground machinery or airplane—and whether applied in the form of emulsion sprays or dusts.

Two systemic phosphorous compounds, sprayed on the cotton plants, were effective in controlling the mites for four weeks.

Dr. Gaines warns that phosphorous compounds are poisonous to higher animals. Operators applying these materials should be protected from breathing the vapors and from direct skin contact. The manufacturer's precautions on the container should be strictly observed.

Results of these tests with mite-killers are given in Progress Report 1431, available from the Publications Office, College Station, Texas.

Texas Cotton Men to Meet

Announcement was made this week that the forty-first annual convention or The Texas Cotton Association will be held March 21-22 at the Hotel Galvez, Galveston, Texas.

State Guides

(Continued from Page 47)

wet they will feed on or above the soil surface. Therefore, an application of DDT or Toxaphene following rain or irrigation and before much drying of the soil occurs will give better control. BHC added to DDT or Toxaphene to give 1 to 2 per cent gamma will drive worms above the soil surface. Soil to be planted should be kept clean of weeds and all other growth for six weeks before planting.

DDT has given better control of the cotton bollworm (corn earworm), several other caterpillars and bean thrips than other insecticides used for the control of cotton insects. At least three pounds of Toxaphene for each pound of DDT recommended are required for bollworm control. DDT (TDE) in the same concentration and formulation as DDT has given good control of corn earworms and other caterpillars on tomatoes.

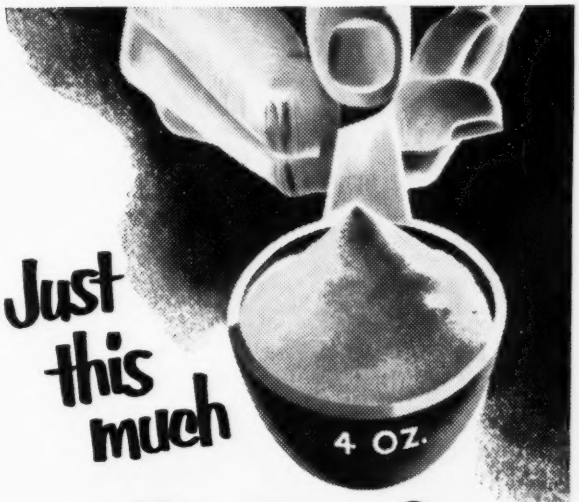
For most of our cotton insects with the exception of the bollworm, the application of one pound of actual DDT per acre will prevent a reinfestation for one month. The interval between applications of DDT for control of the cotton bollworm is close to 2 to 3 weeks—from about late July into early September.

The bean thrips is usually a serious pest in the west and northwest part of the San Joaquin Valley where lygus bugs are the least serious and, therefore, **a mid-July application is usually the most timely there.** In the east, south, and southeast part of the San Joaquin Valley where lygus bugs are usually more serious pests, **two applications, one near the first of July and another a month later,** are the most timely, but should be timed to **follow** by not more than 10 days the cutting of nearby alfalfa, harvesting of potatoes, or other crops on which these bugs feed.

Note 3. Lygus bugs or "cotton daubers" are attracted to succulent or rank-growing cotton. The current changes in cultural practices due to the new variety Acala 4-42, mechanization and other changes somewhat advances the time of insecticide applications for control of lygus bugs and other insects. This insect feeds only on squares and small bolls which it may cause either to fall from the plant or remain on it and develop into deformed flowers and bolls. This injury produces an increase in the growth of leaves and stems and causes loss in quantity and quality of fiber.

Similar types of "shedding" and growth are produced by: 1. An excess of nitrogen, especially with an excess of water; 2. The stress caused by long intervals between irrigations or like effect due to soil type and water penetration; 3. Deep cultivation which destroys surface roots; 4. Combinations of 1, 2, 3, and lygus bugs.

When an average of five per cent of the white blossoms have petals which show the typical lygus injury of crinkled and warty surfaces and the brown spots of injury on the inner floral parts, the infestation is sufficiently heavy for control measures to be taken. Control should also follow if a 15-inch diameter insect net, properly swung 50 times through the tops of one row, collects an average, for several such samples, of 10 adult or 5 young lygus bugs per sample. Therefore, one young is equivalent to two adult insects. An average



aldrin
(dust or spray)

controls insects on a WHOLE ACRE of cotton!

Aldrin's power to kill cotton insects is so great that you need only 4 ounces per acre for control. That's why aldrin is approved and recommended in every cotton state . . . and why aldrin is far and away your best buy for profitable control.

Use the best . . . it costs you less

No other cotton insecticide has aldrin's killing power in such small doses . . . *at so low a cost per acre!* Now's the time to get your aldrin . . . be ready for the first insect visit!

aldrin

SHELL CHEMICAL CORPORATION

Aldrin is manufactured by Julius Hyman & Co., and is distributed by Shell Chemical Corporation, 500 Fifth Avenue, New York 18. Aldrin is available under the brand names of leading insecticide manufacturers. Consult your local dealer and county agent.

of 3 young and 4 adults is equivalent to 10 adults or 5 young.

The Cotton Bollworm or corn earworm has been a serious pest of cotton in California the past few years. For this pest DDT is much more effective and economical, pound for pound, than any other insecticide. The buff-colored moth lays 500 to 3,000 eggs at dusk on the tips of new growth. Because of the rapid growth in this area where eggs are laid, it is difficult to keep an effective residue of the insecticide on these tips. Therefore, unless insecticide applications are properly timed, the chemical will have lost its effectiveness on the older growth by the time the worms reach this part of the plant. Heavy infestations may show up in the terminal growth of the main stalk or the branches two weeks after the effective application of an insecticide. If an average of 4-5 small worms are found in the terminal growth of each 100 plants examined, DDT should be applied. The worms proceed down the plant attacking many squares and bolls which are completely destroyed either by the worms or the fungi "boll rot" which follow their attack. The full-grown worms burrow into the ground and transform there into a moth which emerges and starts laying eggs about 2 weeks after the worm stopped feeding. Little, if any benefit, will result from applying insecticides when the worms are near full growth.

Note 4. During the past five season-insecticides have been applied in concentrated emulsible form with water as the diluent and applied at either 5 or 10 gallons per acre. DDT, Toxaphene, Aramite, TEPP and BHC were applied by fixed wing planes with booms or brushes, helicopter with boom, and some with row-crop spray equipment. The results have been very comparable to those where the same amount of insecticide was applied in dust mixtures. Where 5 gallons per acre was compared with 10 gallons per acre they were equally effective. TEPP (tetraethyl pyrophosphate) in sprays and 1 and 2 per cent parathion in dust have not given satisfactory control of all species of mites on cotton.

The following insecticides are compatible one with another and may be used together in dust and spray combinations: DDT, Toxaphene, benzene hexachloride (BHC), and sulfur. They are not compatible with lime sulfur or other strongly alkaline materials. TEPP is not compatible with lime, lime sulfur, bordeaux, basic lead arsenate, calcium arsenate, doubtful with Cryolite, nicotine, rotenone, pyrethrum, fixed coppers and carbamates. Therefore it is difficult to combine TEPP with other materials in dusts or sprays. The emulsibles have the correct amount of wetting agents in them and none should be added unless the package label so specifies. For most insects on plants, oils are not recommended with the insecticides mentioned above. Moisture on the plants at the time of application may decrease the efficiency of sprays and dusts. This is especially true of TEPP and nicotine for aphid control. Dew or water on plants from rains, sprinklers, etc., may cause excessive run-off, dilution or chemical breakdown of any insecticides, thus making them partially or completely ineffective.

Injury of cotton has occurred from aircraft spraying with emulsible insecticides when temperatures were around 90° F and above. The same combinations applied at lower temperatures, evening and early morning, did not burn the foliage.

Applying, insecticides for the control of thrips and the cowpea aphid on young cotton has so rarely shown benefit that it is not encouraged. Three or more applications about four days apart are required during continued heavy thrips migrations. Concentrated emulsibles applied at the rate of 5 gallons of spray, containing 2 pounds of actual Toxaphene per acre has given the best results to date.

Note 5. The cotton aphid may seriously stunt plants and reduce yields. It often becomes so numerous near harvest time that the honeydew on fiber interferes with both machine and hand picking. It also interferes with ginning and reduces the quality. Infestations may often be kept from becoming widespread by spot dusting in the early season. Nicotine dusts No. 5, No. 8 and No. 10 give good results on dry plants in warm, quiet weather. The experimental work of including aphicides in mixtures used for control of other insects in July and August has shown no benefit in preventing later aphid infestations. Toxaphene has been too uncertain to recommend it for control of heavy aphid infestations. Due to the health hazards and preservations of beneficial insects, nicotine No. 5, No. 8 and No. 10 dusts and nicotine sulphate spray are recommended in preference to the other materials for all early dusting and spraying with ground equipment. Ground or aircraft applications should never be made except when it is very quiet and warm, and plants are dry. Aircraft applications of TEPP spray have given excellent kills of aphids, but rapid re-infestation of fields occurs. Therefore, only late use within 3 to 4 weeks of defoliation is recommended. The results from the use of TEPP dust formulations have been too uncertain to recommend their use.

Parathion and TEPP are only two of several new organic phosphates which we have tried in cotton insect control long enough to evaluate. They have been used for the control of aphids and mites, but the effect on lygus bugs, bollworms, thrips, beneficial insects and others has also been noted. Parathion and TEPP both give an excellent kill of aphids. TEPP has a very brief residual effect which is a disadvantage in the control of mites; since eggs and molting mites are not affected by it. Repeated and closely timed applications are difficult and unsatisfactory for control. However, this rapid hydrolysis is an advantage in the protection of honey bees and, to some extent, other beneficial insects, and a good kill of aphids is obtained. Following the applications of TEPP or parathion the reinfestation is rapid, and too frequently applications for mites or aphids must be repeated every 2-3 weeks for the remainder of the season; therefore, this is not good or satisfactory control. Parathion and TEPP are both too destructive of beneficial insects on cotton to use—except TEPP in late season control of aphids. Parathion near harvest is hazardous for those working in harvest or otherwise handling the crop. In two seasons' work of including one percent parathion with 5% DDT to prevent aphid and mite infestations, the bollworm injury was greater in all the replicated blocks where parathion was included than where it was omitted. Like results have been reported from Arkansas.

Some of the other organic phosphate insecticides may not show the objectionable qualities that these have, but it

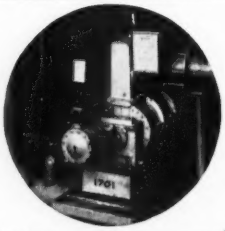
(Continued on Page 100)

Quotes From Our Authors:

"DOLLAR VALUE of cotton and cottonseed kept out of production by pests in 1950 set an all-time record, totaling 907,884,000."

COMPARE

METERS ON THESE THREE ESSENTIALS



Accuracy

Capacity

Space

You'll find R-C Positive Displacement Meters are "tops" in these three basic requirements. *Accurate*, regardless of pressure, wide variations in load or other conditions. Normal *capacities* from 2,500 cfh to 1,000,000 cfh, and ability to absorb overloads. *Compact* to install in relatively small space. For "cash register" gas measurements, insist on R-C Meters. Details in Bulletin 40-B-14.

Roots-Connersville Blower Corporation
523 Carolina Avenue, Connersville, Indiana

REG. U. S. PAT. OFF.

ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

Quotes From Our Authors:

"IF (INSECTICIDES) are applied improperly and ineffectively with the result that the cotton grower's investment is wasted, that farmer loses faith in cotton insect control and the community program is jeopardized seriously."

Conference Report

(Continued from Page 50)

and spider mites. For this reason, benzene hexachloride alone cannot be successfully employed for over-all cotton insect control. Benzene hexachloride may increase spider mites.

In dusts, benzene hexachloride at approximately 0.3 pound of the gamma isomer per acre (example: 10 pounds of benzene hexachloride dust containing 3 percent of the gamma isomer) is the minimum rate which has consistently given satisfactory control of all cotton insects for which it is recommended. The most common commercial dust formulations containing benzene hexachloride used by cotton growers contain 3 percent of the gamma isomer and 5 percent of DDT, with or without sulfur.

A spray formulation containing sufficient technical benzene hexachloride to give 0.3 or 0.4 pound of the gamma isomer plus 0.5 pound of technical DDT per acre has given satisfactory control of the boll weevil and the bollworm. Proper formulation of the emulsion concentrate is necessary to prevent foliage or plant injury.

Benzene hexachloride is toxic to warm-blooded animals. It may enter the body through absorption, inhalation, or ingestion. Proper precautions should therefore be observed in its use.

Grain sorghum, barley, cowpeas, and some other crops are adversely affected by benzene hexachloride. Further research is needed concerning the accumulation of this insecticide in the soil following applications to cotton and the resultant effects on other crops. Until more is known regarding the danger of possible off-flavor in peanuts, Irish potatoes, and some other crops, it is inadvisable to use benzene hexachloride for cotton insect control where the land will later be planted to these crops.

(See Hazards and Precautions in the Use of Insecticides.)

• **Calcium Arsenate** — Calcium arsenate is an economical and effective insecticide for control of the boll weevil and the cotton leafworm, and has excellent dusting qualities. It is used at the rate of 7 to 10 pounds per acre for boll weevil and cotton leafworm control. Twelve to 15 pounds per acre will give fair control of bollworms if applications are properly timed. It is usually used undiluted against the above-mentioned insects. When used without an aphidicide an increase in aphid population often results. Alternate applications of calcium arsenate and formulations containing chemicals that will also control aphids have given excellent results in some areas.

Lime-free calcium arsenate is compatible with organic insecticides. When this calcium arsenate is used with parathion (see precautions under Parathion), the boll weevil, the cotton aphid, and spider mites may be effectively controlled. When lime-free calcium arsenate is combined with 5 percent of DDT and 1 percent of parathion, effective control of the boll weevils, the bollworm, the cotton aphid, and spider mites are obtained. Lime-free calcium arsenate in combination with these materials should be applied at the rate of 10 to 12 pounds per acre.

Calcium arsenate in certain light sandy soils is injurious to some crops, especially legumes and oats. It should not be used for cotton insect control in fields where rice may be planted. Drifting of the dust may injure other crops. Precautions should be taken to avoid drift that might cause bee losses. Calcium arsenate is poisonous and should be handled carefully. Livestock should be kept out of dusted fields. Care should be taken to avoid drift onto pastures, especially when applications are made by airplane.

(See Hazards and Precautions in the Use of Insecticides.)

• **Chlordane**—Chlordane will control the boll weevil, the cotton fleahopper, the tarnished plant bug, the rapid plant bug, grasshoppers, sand wireworms, and thrips. It will not control the bollworm, the yellow-striped armyworm, the cotton aphid, the pink bollworm, or spider mites. Although it kills a high percentage of boll weevils in squares and bolls, the practical benefit derived therefrom has not been demonstrated.

For the insects against which chlordane is effective, from 0.5 to 1.5 pounds of technical material per acre is required.

For over-all cotton insect control, chlordane should always be formulated with DDT and the rate of application should be such that from 1 to 1.5 pounds of technical chlordane and from 0.5 to 0.75 pound of technical DDT per acre will be applied.

The dust formulation generally recommended should contain 10 percent of chlordane plus 5 percent of DDT and should be applied at the rate of 10 to 15 pounds per acre. Sprays should contain 2 parts of chlordane to 1 part of DDT.

These formulations have given excellent results in some areas, while in others the results have been erratic.

The cotton aphid and spider mites may increase to damaging proportions after applications of chlordane-DDT sprays and dusts. Careful inspections for these two pests should be made at weekly intervals after the application of chlordane-DDT formulations; and, if an increase of either species is observed, appropriate measures, as outlined under the respective pests, should be taken to control them.

The toxicity of chlordane to higher animals is greater than that of DDT. Operators should avoid breathing the dust or mist. Contamination of food and feed crops around cotton fields should be avoided.

There have been little or no ill effects on plants from accumulations of chlordane in soils, when this material has been properly applied.

(See Hazards and Precautions in the Use of Insecticides.)

• **DDT**—DDT will effectively control the bollworm, the pink bollworm, the fall armyworm, the tarnished plant bug, some species of stink bugs, the rapid plant bug, the cotton fleahopper, and thrips. Unsatisfactory results were reported in some instances when the temperature exceeded 90° F. It will also control certain species of cutworms and to a lesser extent the yellow-striped armyworm. It will not control the boll weevil, the cotton leafworm, spider mites, the cotton aphid, and grasshoppers.

As a dust on cotton, DDT is ordinarily used at concentrations of 5 to 10 percent. It is used either alone or in combination with other insecticides and miticides, and at rates of 10 to 20 pounds per acre. However, not less than 15 pounds per acre of 10 percent DDT should be used for pink bollworm control.

Sprays and dust containing DDT are about equal in effectiveness against cotton pests. Thorough coverage of the plant and proper timing of applications are more important than the type of formulation used.

Where DDT is used, aphid and mite populations may increase until severe injury occurs unless an aphidicide and a miticide are included in the treatment.

DDT is toxic to certain plants such as cucurbits. Its toxicity persists and accumulates in the soil, and therefore it should be used only in the minimum amounts recommended for cotton insect control, especially on light sandy soils.

In applying DDT, contamination of adjacent crops from drift should be avoided.

DDT is highly toxic to fish and amphibians, and precautions should be taken to avoid the possibility of stream pollution.

Acute toxicity of DDT to man and animals is rather low as compared with inorganic insecticides now in use on cotton. However, when DDT is repeatedly ingested or brought into contact with the skin it is absorbed and may be stored in the fatty tissues. Injury to liver may also result. Unnecessary exposure of operators should therefore be guarded against.

(See Hazards and Precautions in the Use of Insecticides.)

• **Dieldrin** — Dieldrin was used experimentally for cotton insect control in many locations throughout the Cotton Belt in 1950 and 1951, and was recommended for cotton insect control in several states in 1951. It is effective against the boll weevil when applied at the rate of 0.15 to 0.5 pound per acre. It is effective against thrips, the cotton fleahopper, the tarnished plant bug, the rapid plant bug, the fall armyworm, grasshoppers, and the variegated cutworm when applied at dosages of 0.05 to 0.15 pound per acre. It is effective against the garden webworms at 0.25 pound per acre and against heavy infestations of pale sided and granulate cutworms and the yellow-striped armyworm at 0.375 to 0.5 pound per acre. It is not effective at low dosages for bollworm control, and DDT should be added when control of this insect is necessary. Dieldrin may increase spider mites and the mixture of dieldrin and DDT may increase aphids. Dieldrin will kill newly hatched cotton leafworms at dosages effective against the boll weevil.

(Continued on Page 65)

During the past fifty-five years we have watched many ambitious and enterprising manufacturers endeavor to copy the very extensive Oberdorfer line of bronze rotary gear pumps or present the world with their substitute.

It was not our business to notify these gentlemen that it would be financial suicide to try to duplicate the combination of quality and price so long associated with the name of Oberdorfer thruout the world. History is amply littered with the evidence.

There are available today many spray pumps more intricately designed, more delicately constructed and more costly to purchase and operate in the field.

Why gild the lily! Demand an inexpensive, trouble free, corrosive resistant bronze gear pump that accurately meters your spray formulations, positively, efficiently and at the lowest cost per acre.

BUY *Oberdorfer*

Agricultural Pump Div., Oberdorfer Foundries, Inc.
1523 Thompson Rd., Syracuse, N. Y.

BRONZE OBERDORFER SPRAYING PUMPS

World Production of Fats and Oils Is at a Record Level

World production in 1951 of the principal fats, oils, and oilseeds—all in terms of fat and oil—is estimated at a record 25,850,000 short tons. This is an increase of nearly 2 million tons from 1950, or 8 percent. Compared with prewar, world production is indicated to be up 13 percent. Thus, for the first time since the war, output of fats and oils was sufficiently great to restore the world's per capita supply to approximately the prewar level.

The restoration of per capita supply to about the prewar level is perhaps the most significant development of recent years. However, world trade in 1951 remained below prewar and may decline slightly in 1952. The estimated trade for 1951 is 6,290,000 tons compared with 6,537,000 prewar and a tentative forecast of around 6,000,000 tons for 1952. This indicates a somewhat changed pattern of distribution of world supplies with marked increases in some areas and continued deficits in terms of prewar in others. In fact, fats and oils were still rationed in a number of countries at the end of 1951.

• **Production Estimates**—Edible vegetable oils, estimated at 8,955,000 tons, represent slightly more than one-third of the total 1951 production. And this group of oils accounts for the bulk of the increase in total world production compared with 1950—mainly as the result of the Mediterranean olive oil output which is up 870,000 tons from 1950. Other important increases are cottonseed oil and sunflower seed oil. The U.S. accounts for most of the cottonseed oil increase of some 300,000 tons. Sunflower seed oil is up sharply, largely because of expanded production in Argentina.

Total production of palm oils is estimated at 3,980,000 tons, up 7 percent from 1950 and 10 percent above prewar. The increase here is entirely in coconut oil and resulted from a sharply expanded output of copra in Indonesia, and to a lesser extent to increases in the Philippines and Ceylon.

Industrial oils are estimated at 3,115,000 tons for 1951—down slightly from 1949 and 1950 but 7 percent above prewar. Linseed oil, however, which accounts for most of the recent decrease in this group, was below prewar in 1951. The smaller output is explained mainly by a sharp reduction in Argentina's flaxseed crop, and a substantial reduction in the U.S.

In the animal fats group—which makes up another one-third of total world supplies—production is estimated at 8,885,000 tons. This is about 4 percent above 1950 and 7 percent above prewar. The increase from 1950 is explained largely by expanded lard and pork fat production in the U.S. and Europe. Tallow production is up sharply from prewar but down slightly from 1950. Butter still ranks as the largest single source of fat in the world, followed closely by lard (including unrendered pork fat).

Total production of marine oils reached 915,000 tons, up 7 percent from 1950 but still 15 percent below prewar. A sharp rise occurred in sperm oil because the demand was strong and the total catch of sperm whales was not limited by international agreement.

• **International Trade**—About one-fourth of total production of fats, oils, and oilseeds—in terms of oil equivalent—enters world trade. Trade in 1951 was the highest of the postwar years and reached an estimated 6,290,000 tons. Compared with 1950, there were a number of increases and decreases among the individual items. Most important, however, in raising the trade figure above 1950 was a 250,000-ton increase in coconut oil, mostly in the form of copra. This is by far the largest item of trade, accounting for more than 20 percent of the total. Palm oils as a group made up nearly 40 percent of the world trade although only 15 percent of production.

Other comparisons of 1951 with 1950 show decreases for the edible vegetable oil group where a sharp rise in soybean oil exports failed to offset decreases in cottonseed, peanut, and olive oils. Trade in industrial oils was down slightly because decreases in castor and tung were not offset by increased shipments of linseed oil. Trade in animal fats also decreased slightly. Heavy lard purchases in the U.S. by the United Kingdom and Yugoslavia failed to offset declines in tallow exports from the U.S. and Argentina and a net decline in butter exports from the major surplus-producing countries.

Trade in edible vegetable oils is expected to recover in 1952. Improved peanut crops in Africa and increased cottonseed production in the U.S. are important considerations. These should more than offset a probable decline in soybean oil trade resulting from sharply reduced imports by Spain and Italy from the U.S. On the other hand, present indications are that trade in the important palm oil group may decline mainly because the Philippines and Indonesia do not expect to maintain their 1951 rate of copra production during 1952.

(Continued from Page 63)

It is effective either as a dust or spray.

Dieldrin is toxic by skin absorption, by inhalation and by ingestion. It is recommended for use on cotton only where persons applying it are fully aware of the hazards and will follow the precautions presecribed by the manufacturers.

(See Hazards and Precautions in the Use of Insecticides.)

• **Heptachlor**—Heptachlor was used experimentally for cotton insect control in many locations throughout the Cotton Belt in 1951. It was effective in controlling the boll weevil when applied at the rate of 0.25 to 0.75 pound of technical material per acre in either dust or spray form. It did not control the bollworm and therefore should be mixed with DDT at the recommended rates when it is used for mid-season or late-season boll weevil control. Field tests indicate that heptachlor is effective against thrips at 0.25 pound per acre, against cutworms at 1 pound per acre and against garden webworms at 0.5 pound per acre.

Heptachlor did not control the bollworm, the yellow-striped armyworm, the cotton leafworm, the cotton aphid or spider mite. Heptachlor may increase spider mites and the mixture of heptachlor and DDT may increase aphids.

Heptachlor is more toxic to higher animals than chlordane. Operators should avoid breathing dusts and avoid unnecessary contact with sprays containing this material. Information is limited regarding the effect of repeated or prolonged exposure to heptachlor or the possible ill effects on plants from accumulations of it in soils.

(See Hazards and Precautions in the Use of Insecticides.)

• **Lindane**—Lindane, the essentially pure gamma isomer of benzene hexachloride, may be substituted on an equivalent weight basis for the gamma isomer of benzene hexachloride in formulations of insecticides used on cotton insects.

Lindane is toxic to warm-blooded animals. It may enter the body through absorption, inhalation, or ingestion. Proper precuations should therefore be observed in its use.

(See Hazards and Precautions in the Use of Insecticides.)

• **Methoxychlor** — Dusts containing 10 percent of methoxychlor controlled the cotton leafworm, but lower concentrations gave poor control.

Methoxychlor gave slightly better pink bollworm control than DDT, but a heavy build-up of aphids usually followed its use and it failed to control bollworms. For these reasons it is not being generally used for pink bollworm control.

Methoxychlor is less effective than the insecticides now recommended for the control of the boll weevil, the bollworm, the cotton aphid, the garden webworm, spider mites, and stink bugs.

Methoxychlor is less toxic than DDT to worm-blooded animals and it is less likely to be stored in the fat or excreted in the milk.

(See Hazards and Precautions in the Use of Insecticides.)

• **Nicotine**—Two percent of nicotine in alternate applications of calcium arsenate, if properly applied (the period between nicotine applications not to exceed 8 to 10 days), will usually prevent a cotton aphid build-up.

Either 2 or 3 percent of nicotine in a suitable carrier can be used to knock out heavy aphid infestations. At least 0.2 pound per acre of free-nicotine equivalent should be applied. The source may be either nicotine sulfate or a fixed nicotine in dust form.

Applications of nicotine dust to knock out heavy aphid infestations should be applied when the air is calm and preferably when there is no dew on the plants. Complete coverage is essential.

Nicotine is highly toxic to man and animals and should be used with adequate precautions.

(See Hazards and Precautions in the Use of Insecticides.)

• **Octamethyl Pyrophosphoramide**—This systemic poison is in preliminary stages of investigation and not recommended.

In laboratory tests, octamethyl pyrophosphoramide was translocated by cotton plants when applied to the soils in which the plants were growing. A single soil application of 4 to 8 pounds per acre of the technical compound caused the plants to remain toxic to cotton aphids and spider mites for several months. Lower dosages were ineffective. Spray application to foliage of 1 pound of the compound per acre gave aphid and mite protection for 2 to 4 weeks. Cotton seedlings grown from seed treated with 1 pound of octamethyl pyrophosphoramide per 100 pounds of seed were toxic to aphids and mites for 6 weeks. Higher dosages reduced seed germination and otherwise adversely affected the plant. Octamethyl pyrophosphoramide was ineffective against the boll weevil, the bollworm, the cotton leafworm, the cotton fleahopper, thrips, and a number of other cotton insects. In field tests conducted during 1951 octamethyl pyrophosphoramide applied in the conventional foliage spray at a rate of 0.5 to 1.0 pound per acre gave excellent control of spider mites.

Octamethyl Pyrophosphoramide is an extremely dangerous poison to man and other animals. In handling it, the same precautions as indicated for parathion should be followed. Until investigations disclose that this material does not persist, cottonseed meal or other cottonseed products from treated plants should not be fed to livestock.

(See Hazards and Precautions in the Use of Insecticides.)

• **Parathion**—Parathion will control the cotton aphid, spider mites, the garden webworm, and the cotton leafworm. It may be used as a 1-percent dust alone or in combination with other insecticides. It gives very little control of the boll weevil, the fall armyworm, the variegated cutform, the bollworm, and the pink bollworm. Bollworm populations sometimes increase following applications of parathion.

Parathion is an extremely dangerous poison. It is recommended for restricted use in some states where qualified personnel are in a position to assume full responsibility and to enforce proper precautions as prescribed by the manufacturers.

(See Hazards and Precautions in the Use of Insecticides.)

• **Rotenone**—One percent of rotenone in calcium arsenate at each application made against the boll weevil has given satisfactory control of the cotton aphid.

• **Sulfur**—Sulfur has been widely used on cotton for control of certain species of spider mites and the cotton fleahopper. When used in dust mixtures it sometimes has a repressive effect upon aphid populations in some areas. Where spider mites are likely to be a serious problem, 40 percent of sulfur or an appropriate amount of other suitable miticide should be included in organic insecticide dusts to prevent the development of damaging mite infestations. The supply of sulfur is very short for 1952 and it should not be used as a diluent for other insecticides.

• **Systox**—Two years' field and greenhouse tests have shown this material to be effective against the cotton aphid and spider mites both as a spray applied to the foliage and as a systemic applied to the soil. The use of 0.5 milligram of technical material per pound of soil has given a month's protection to cotton against these pests in the greenhouse. In the field, 0.2 pound of technical material per acre applied to the soil gave a month's protection against aphids.

Cotton leafworms, half-grown and larger, were controlled by spraying the foliage with 0.5 to 0.75 pound of systox per acre. Field tests, conducted in 1951, indicate that systox may increase the effectiveness of toxaphene against the bollworm when used at the rate of 0.15 pound or more of systox to 2 pounds or more of toxaphene per acre.

Systox will not control the boll weevil, bollworm, thrips, or grasshoppers nor has it shown itself effective as a systemic by means of seed treatment at rates of up to 1 pound of technical material per 100 pounds of cotton seed.

Systox is an extremely dangerous poison to man and other animals. In handling it the same precautions as indicated for parathion should be followed. Until investigations disclose that this material does not persist, cottonseed meal or other cottonseed products from treated plants should not be fed to livestock.

(See Hazards and Precautions in the Use of Insecticides.)

• **Tetraethyl Pyrophosphate (TEPP)** — Tetraethyl pyrophosphate, commonly referred to as TEPP, is highly effective as a spray against the cotton fleahopper, the cotton aphid, and spider mites when used on dry plants at proper intervals. Experiments indicate that applications containing 0.5 pint of 40 percent tetraethyl pyrophosphate, or its equivalent, per acre effectively control heavy populations of these pests.

Tetraethyl pyrophosphate is an extremely dangerous poison. It is recommended for use on cotton only where a

Quotes From Our Authors:

"THE USE OF insecticides is now generally recognized as a 'must' to profitable cotton production in the West. The increases in yields from the proper use of insecticides are large, oftentimes amounting to a bale or more per acre."

qualified person is in a position to assume full responsibility and to enforce proper precautions as prescribed by the manufacturers. It deteriorates very rapidly when exposed to moisture or moist air and is incompatible with alkaline materials. It should be applied immediately after mixing with water. The residual toxicity of this chemical is very short.

(See Hazards and Precautions in the Use of Insecticides.)

• **Toxaphene** — Toxaphene will control the boll weevil, the fall armyworm, the tarnished plant bug, the rapid plant bug, the cotton leafworm, cutworms and grasshoppers when applied at the rate of 2 to 3 pounds of the technical material per acre. It is slightly less effective against the bollworm and yellow-striped armyworm. It will also control the cotton fleahopper and thrips when applied at the rate of 0.75 to 1 pound of the technical material per acre. Dusts and sprays are about equally effective in most areas when properly applied.

Bollworm control was improved where DDT at the rate of 0.25 to 1.0 pound per acre was incorporated in the toxaphene spray mixture. Toxaphene alone will not give satisfactory control of the pink bollworm.

Where toxaphene was used throughout the season satisfactory suppression of the cotton aphid resulted. It will not, however, control heavy aphid infestations. It will not control spider mites, and its use may result in their increase; therefore, in some areas it is recommended that dusts contain at least 40 percent of sulfur or an appropriate amount of some suitable miticide.

No economic injury to cotton has been reported from the use of toxaphene. This material can be handled with relative safety to the operator if proper precautions are taken. Toxaphene is toxic to livestock and poultry, and is very toxic to fish.

(See Hazards and Precautions in the Use of Insecticides.)

Promising New Insecticides Tested in 1951

• **Compound 269** — Compound 269 is a stereoisomer of dieldrin and chemically designated as 1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a, 5, 6, 7, 8, 8a-octahydro-1, 4, 5, 8-endo-endo-dimethanonaphthalene. In limited field tests when applied as dust or sprays at 0.2 to 0.5 pound per acre, it was effective against the boll weevil, the bollworm, the tobacco budworm, the variegated cutworm, the fall armyworm, and the tarnished plant bug. It was found to be toxic to a wide range of lepidopterous larvae and 0.2 pound per acre gave bollworm control equal to 0.5 pound of DDT. In late-season tests it gave excellent control of the boll weevil and bollworms. Compound 269 did not control spider mites and was only moderately effective against the yellow-striped armyworm. Aphids did not build up to damaging numbers following its use. Because of limited tests compound 269 is not recommended for general cotton insect control but should be widely tested in large-scale experiments in 1952. Mammalian toxicity data available indicate this compound to be highly toxic. It should be handled with extreme care.

(See Hazards and Precautions in the Use of Insecticides.)

• **EPN (ethyl p-nitrophenyl thionobenzenephosphonate)** — Laboratory tests in 1950 indicated that EPN might be useful in control of several cotton insects and mites. In field tests during 1951 EPN at the rate of 0.3 pound per acre of the technical product failed to give satisfactory control of boll weevil, bollworms, cutworms and some species of spider mites. At that rate it was highly effective for control of the yellow-striped armyworm.

EPN at the rate of 1 pound per acre showed promise for pink bollworm control. Control of bollworms was obtained with applications of 1.25 pound.

Further tests are needed to determine its place in the control of cotton pests.

The mammalian toxicity is less than parathion but is nevertheless high in relation to most poisons used in cotton insect control and it should be handled with precaution.

(See Hazards and Precautions in the Use of Insecticides.)

• **Compound 711** — Compound 711 is a stereoisomer of aldrin and chemically designated as 1, 2, 3, 4, 10, 10-hexachloro-1, 4, 4a,5, 8, 8a-hexahydro-1, 4, 5, 8-endo-endo-dimethanonaphthalene. In limited field tests compound 711 gave considerable control of the boll weevil at 0.2 pound per acre. It was relatively ineffective against the bollworm, the fall armyworm, and the yellow-striped armyworm. Preliminary investigations indicate a rather high acute oral toxicity. Conclusions on the effectiveness of this chemical cannot be reached on the basis of present results.

(See Hazards and Precautions in the Use of Insecticides.)

Quotes From Our Authors:

"IN THIS PERIOD of national defense, when every bale can be used to forge a stronger free world, it becomes imperative that all of us strive for the best possible control of insects that affect the production of cotton."

The following new insecticides were found during 1951 to be promising enough to justify carrying into field tests during 1952 for further evaluation. The statements are based entirely on results obtained from field cage laboratory experiments.

• **Methyl Parathion (methyl ester of parathion)**—This compound appears very promising against the boll weevil at dosages of between one-fourth and one-half of a pound of the technical compound per acre and would be highly effective against the cotton aphid and spider mites within this range. It is highly effective against the cotton leafworm at dosages as low as one-twentieth of a pound per acre. It does not appear especially promising against the bollworm although some bollworms are killed by it when applied within the one-fourth to one-half pound per acre range.

• **Metacide**—This product is a mixture containing 6.2% of parathion, 24.5% of methyl ester of parathion, 2.7% of related organic phosphates, and 66.6% of a special emulsifer, Thiosolve 8139. It showed considerable promise against the boll weevil at dosages of between three-tenths and one-half of a pound of total active ingredients per acre and was highly effective against the cotton aphid and spider mites within this range. It was also highly effective against the cotton leafworm at a dosage as low as 0.075 pound of total active ingredients per acre. It does not appear to be highly effective against the bollworm.

• **Maiathon, also called Compound 4049 (o,o-dimethyl dithiophosphate of diethyl mercoptosoccinate (S-(1,2-dicarbethoxy-ethyl) O,o-dimethyl dithiophosphate)** — This compound appears promising for the control of boll weevil, spider mites and the cotton aphid within the range of one to two pounds of the technical material per acre. It is not effective against the bollworm.

• **Compound 1795**—Compound 1795 is a derivative of the chemical 2, 3, 3a, 4, 5, 6, 7, 7a, 8, 8-decachloro-3a, 4, 7, 7a-tetrahydro-4, 7-methanoidene-1-one. At dosages of approximately two pounds of this chemical per acre, promising results were secured against the boll weevil. Results against the bollworm were erratic.

• **Compound Q-129 (1,2,4,5,6, 7-hexachloro-1,1-dimethoxy-4, 7-methano-3a,4,-7,7a-tetrahydroindane)**—In limited tests with this compound, it appeared promising against the boll weevil when applied at approximately two pounds of the technical material per acre. Erratic results were obtained against the bollworm.

• **B. F. Goodrich Insecticide 3960—X14** —A mixture of chlorinated terpene isomers. This compound reacted similarly to toxaphene when applied at comparable dosages. It is effective against the boll weevil, the bollworm, and the cotton leafworm.

• **Dimethyl Potasan (the dimethoxy thiophosphoric acid ester of 7-hydroxy-4-methyl coumarin)** — This compound showed promise against the boll weevil at dosages of from one-fourth to one-half pound of the technical material per acre and the indications are that the cotton aphid and spider mites would also be controlled by dosages within this range. Bollworm control might be expected to be inadequate with this range of dosages.

Cultural Practices Aid in the Control of Cotton Insects

Certain cultural practices reduce cotton losses from insect pests and often reduce and may eliminate the need for insecticides. The use of such practices should be encouraged. This is especially important when insecticides are in short supply. Several of the following practices may be used by any cotton grower. Others are applicable to certain areas and conditions only. Growers should, in addition to following these practices, continue to make careful observations for insects and apply insecticides when needed.

• **Planting** — Reasonably early planting of all cotton within an area during a short period enables the crop to produce maximum growth and fruit before insects multiply and spread from field

to field and makes possible earlier stalk destruction.

• **Varieties**—Prolofic varieties of cotton that fruit early and mature quickly may set a crop before the boll weevil and other insects become numerous, especially if other cultural controls are used.

• **Soil Improvement**—More injury from insects, without yield reduction, can be tolerated by rapid-growing cotton in rich soil than by cotton growing in poor soil. For this reason, practices such as fertilization, rotation of crops, and plowing under of green manure tend to offset insect losses. Planting of winter cover crops to improve the soil and prevent erosion is recommended.

• **Other Host Crops of Cotton Pests**—Cotton fields should be located as far as is practicable from other host plants of cotton insects. Thrips breed in onions, potatoes, carrots, and some other crops and later move in great numbers into adjacent or interplanted cotton. Garden webworms and variegated cutworms and Lygus bugs may migrate to cotton from alfalfa. The cotton fleahopper migrates from croton and other weeds.

• **Hibernation Areas** — Boll weevils hibernate during the winter in well-drained, protected areas in and near cotton fields. Spider mites hibernate in low-growing perennials in or near fields. Clean cultivation reduces weevil hibernation quarters. Small patches of weeds near fields, along turnrows and fences, or around stumps and scattered weeds in cultivated fields or pastures can be destroyed at a small cost. Such practices are more effective where the cotton acreages are in sizeable blocks rather than in small patches. The general burning of ground cover in woods is not recommended.

• **Early Stalk Destruction**—The destruction or killing of cotton plants by either mechanical or chemical methods, as early as possible before the first killing frost, forces boll weevil into starvation before they go into winter quarters. The result of early stalk destruction, especially over community- or county-wide areas, has greatly reduced the boll weevil problem in the Lower Rio Grande Valley and in other parts of Texas. This practice is also recognized as important in pink bollworm control in most areas. Plowing under the crop residue as deeply as possible after the stalks are cut will also reduce the survival of the pink bollworm. Modern mechanically operated stalk cutters and shredders facilitate early stalk destruction and complete coverage of crop residues.

Legumes in Relation to Cotton Insect Control

Soil-building and soil-conserving leguminous crops are generally fundamental in a cotton-growing program. It is further recognized that a number of insects that attack legumes later transfer to cotton, thereby increasing the cotton insect problems. This situation may have a tendency to, but definitely should not, discourage the use of legumes. Entomologists should give serious consideration to insect control for the protection of both legumes and cotton.

Bug-Catching Machines

Bug-catching machines are not recommended as a means of controlling cotton insects.

Chemical Defoliation As an Aid to Insect Control

Defoliations of cotton with chemicals has a direct relation to cotton insect control. Defoliation of cotton has been found to cause boll weevils to leave such fields almost immediately. It also reduces the percentage of locks infested by weevils. Where cotton has been defoliated a much smaller number of weevils have been found the next spring. Damage to open cotton by heavy aphid populations and by late cotton leafworm infestations has been prevented by chemical defoliation.

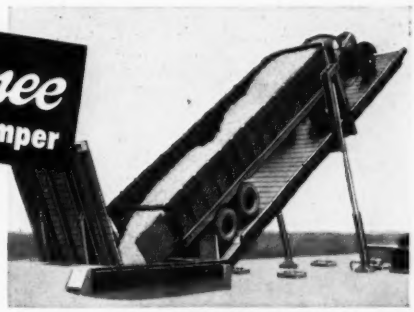
Proper defoliation checks the growth of the cotton plant and accelerates the opening of the bolls. The crop may be harvested earlier, thereby permitting earlier destruction of the stalks, and important aid in boll weevil and pink bollworm control.

For best results defoliants should not be applied until the last bolls expected to make cotton are at least 25 days old. Satisfactory defoliation cannot be expected if excessive soil moisture, high fertility, or insufficient insect control cause plants to be highly vegetative. Second growth also has been found very difficult to remove with chemical defoliants,

Detailed guides for use of different

(Continued on Page 70)

Kewanee
Cottonseed Dumper



- Sizes—40', 45' and 50' Platforms. Other sizes special.
- Capacities to 80,000 lbs.
- Hydraulic 10'x10' Pit Door.
- TWIN Hydraulic Power Units.
- Pit and Pitless Models. Pitless reduces foundation costs.

This New KEWANEE Pitless Model cuts foundation costs to a minimum.

UNLOADS all sizes of Trucks and big Tractor Trailers in a "jiffy." Takes all the time-stealing hard work out of unloading...eliminates waiting time and keeps trucks "on the go."

Powerful TWIN Hydraulic Unit. Raises to 43° angle in less than a minute, lowers in 25 seconds. Maximum safety because of "oil-locked" hydraulic control. No danger of accidents.

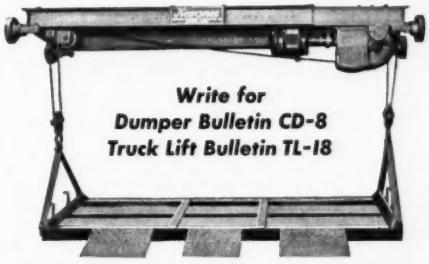
Pit Door opens and closes hydraulically in seconds, permits cottonseed to be dumped directly into open pit.

Easy, simple controls . . . one man operates the Dumper, Wheel Stops and Pit Door from one location. Eliminates back-breaking labor and cuts costs.

Evidence of KEWANEE performance and economy is overwhelming. It is substantiated by successive repeat orders from outstanding firms who have installed them in all their plants.

Every Trucker and Ginner is a real booster. They appreciate "no long waiting in line" in busy hauling seasons and they tell others. It attracts new customers, widens your territory and expands your volume.

WRITE FOR BULLETIN — find out how KEWANEE will cut your unloading costs.



Write for
Dumper Bulletin CD-8
Truck Lift Bulletin TL-18

Kewanee
Truck Lifts

- Adjustable for Driveways 11' to 15'6" widths.
- Low Head Room.
- Large, deep flanged Winding Drums. Uniform winding.
- Cut Worm Gear Reducer.
- Crucible steel Lifting Cables, extra flexible.

ENGINEERED for easy operation and dependable performance, backed by 31 years' know-how in the grain trade.

Extra strength channel steel frame provides rigid support for operating mechanism. All working parts are below the frame, permitting maximum lift.

Telescoping frame adjustable every 2" for driveways 11'0" to 15'6". New heavy duty Cradle of greater strength and utility. Strong lifting cables.

Whatever your unloading problem, there's a KEWANEE to handle it. Write for Free Bulletin and full information.

DISTRIBUTORS
INDUSTRIAL SUPPLIES, Inc.
Poplar Ave. & River Front, Memphis, Tennessee
R. C. BROWN, 5538 Dyer St., Dallas 6, Texas

KEWANEE MACHINERY & CONVEYOR CO., Kewanee, Illinois

MISS E. A. JENSEN, National Cottonseed Products Association Fellow, shown examining dehulled cottonseed kernels from seed of 17 percent moisture content stored four months at 80° F. The seed on the right received a fungicide treatment.

Research on the

Storage of Cottonseed[1]

By EDITH A. JENSEN, Fellow, National Cottonseed Products Association; and J. S. LAMBOUR, M. G. LAMBOU, and A. M. ALTSCHUL, Southern Regional Research Laboratory,[2] New Orleans.

Introduction

INVESTIGATIONS on the storage of cottonseed during the past year have been conducted in continuation of the 1950 program to study two methods of handling—heat and fungicides—as complementary agents to chemical treatment. Information not available at the time of the 1950 report and progress made during 1951 are included. Since, however, this is the final report of the fellow on the storage of cottonseed prior to transfer to other investigations, a brief summary of accomplishments during the tenure of fellowship precedes the report of progress.

Review of the Work in Which the Fellow Participated: 1948-1950

The accomplishments of the fellow can best be reviewed by first setting forth the essential facts known at the time the fellow began participating in the work. The approach taken by investigators at this Laboratory to improve the storage quality of cottonseed had been to apply chemicals to the seed to minimize deterioration during the interval between harvest and processing. Commercial practice of forced ventilation, while successful in cooling seeds once heated, does not prevent recurrence of spontaneous heating or other deteriorative changes, such as formation of free fatty acids and increase in red color of the oil. Laboratory work (THE COTTON GIN AND OIL MILL PRESS, Jan. 8, 1949) had established these facts:

When applied in relatively low concentrations, a number of compounds, different in chemical structure, inhibited deterioration in artificially moistened cottonseed.

When two of the active chemicals were mixed, viz., propylene glycol dipropionate and 1,3-dimethyl-4,6-bischloromethyl benzene, the mixture inhibited heating in artificially moistened seed for longer periods than either chemical used alone, even when each was used at double the concentration. This mixture was also more effective than mixtures of other active chemicals.

The soundness of these conclusions had been tested by conducting a series of storage experiments in cooperation with the cottonseed processing industry using 20- to 30-ton lots of seed. Information concerning the nature of the cottonseed storage problem was collected during the field operations (J. Am. Oil Chem. Soc. *28*, 241-245, 1951). It was observed that chemical treatment inhibited spontaneous heating in naturally moist seed during storage under mill conditions. Seed which had a relatively high temperature before chemical treatment cooled very slowly. The initial high temperature of the seed and the slow rate of cooling were believed to have reduced the effectiveness of the chemical mixture in controlling other aspects of deterioration. Laboratory experiments were initiated, therefore, to investigate the use of chemical treatment followed by forced ventilation. The fellow joined the staff during this period and was given the responsibility for conducting these experiments.

The laboratory tests then conducted showed that chemical treatment supplemented by forced ventilation was more effective than either chemical treatment or forced ventiliation alone in preventing deterioration. The validity of this conclusion was tested in three storage experiments in commercial mills. The treatment consisted of a 10:1 mixture of propylene glycol dipropionate and the isomers, 1, 3-dimethyl-2, 4-and-4, 6-bischloromethyl benzene (use of the isomers lowered the cost of the treatment but did not substantially alter its activity). Various intervals of forced ventiliation were used, but the most effective control over deterioration was obtained when the treatment was supplemented by continuous and prolonged ventilation until the moisture content was substantially reduced. Spontaneous heating of naturally moist cottonseed was controlled for 132 days and the development of free fatty acids was inhibited for 52 days. Similar results were obtained in the other experiments. They confirmed the trends previously established in laboratory tests but differed from them in that the development of free fatty acids was not controlled for as long as spontaneous heating. The effectiveness of the treatment was, therefore, not considered sufficient for commercial application. However, the maximum inhibition of deterioration thus far achieved has been obtained with this particular chemical mixture, and extensive information on its activity in laboratory and large-scale experiments is now available. For these reasons, its effect may be used as a basis for evalu-

[1]Annual report of the National Cottonseed Products Association Fellow for 1951.

[2]One of the Laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U.S. Department of Agriculture.

ating new treatments in future laboratory investigations.

Prolongation of the time interval during which the formation of free fatty acids is prevented would improve the effectiveness of the treatment. Several possibilities exist by which this may be accomplished, but the scope of the investigations was limited to an examination of the effects of heat and fungicides on the seed. Either of these two methods of handling, alone, combined with each other, or combined with chemical treatment, may produce results superior to those achieved with the chemical mixture supplemented by forced ventilation. However, before this possibility can be explored, it is necessary to investigate the effects of heat and fungicides, separately, on cottonseed.

Since naturally moist seed had been used in all large-scale experiments and artifically moistened seed in all laboratory tests, the two types of seed were compared in the laboratory. These comparisons showed that chemical treatment retarded the formation of free fatty acids for a longer period in artificially moistened seed than in naturally moist seed. Therefore, all future laboratory experiments to determine the effectiveness of new methods of handling in controlling the formation of free fatty acids are to be conducted with naturally moist seed.

Current Investigations

• **Effect of Heat** — For the past two years, experiments have been conducted to establish the heating conditions which do not damage cottonseed. The effects of heat were measured as changes in viability, oxidation-reduction potentials, free fatty acids, and red color. Naturally moist seed of differen virieties, grown at widely separated localities and of moisture contents from 20% to 12% were used. Temperatures ranged from 80° to 160° F. at time intervals of 10, 20, and 30 minutes. Measurements were made immediately after heating and during storage of the seed under controlled conditions. The effect of heat alone was measured by the elimination of other variables. Thus, the moisture content of the seed was maintained during some of the heat-treatments. It was expected, however, that, if moisture was lost during the application of heat, the reduction would contribute favorably to the storage properties of the seed. Therefore, heat-treatments were applied in which moisture was allowed to evaporate during the operation.

On Naturally Moist Cottonseed of 20% Moisture Content. In the last annual report (THE COTTON GIN AND OIL MILL PRESS, Feb. 17, 1951), it was stated that heating at temperatures of 80°, 100°, 120°, 140°, and 160° F. for 10, 20, and 30 minutes had no immediate effect on the content of free fatty acids of the seed. Heating at 80°, 100°, and 120° F. for the various time intervals did not cause any change in the number of viable seeds; at 140° F. it delayed and reduced germination. Heating at 160° F. for 10 minutes destroyed viability in all the seeds. All the changes in viability took place whether or not a reduction in moisture content occurred, except in seed heated at 140° F. for 10 minutes. In this case, an increase of 18% in the number of viable seeds occurred only if the moisture content of the seed was maintained during heating.

Samples of the various lots of heat-treated seed were made available to other investigators in the Southern Regional Research Laboratory. Oxidation-reduction potential measurements on selected samples appeared to be correlated with viability of the seed. By applying a recently published chromatographic method for neutral oil content (J. Am. Oil Chem. Soc. 27, 260-264, 1950), the Analytical and Physical Division found that the heat treatments applied had not affected the red color of the oil.

Results of the effect of heat, with and without a reduction in moisture content, on viability and the development of free fatty acids in seed of 20% moisture content, stored under anaerobic (in the absence of free air circulation) conditions at 80° F. are now complete. There appeared to be an earlier rapid rise in free fatty-acids content of seed heated without a loss in moisture content as compared to the unheated seed. In these samples a significant reduction in viability occurred that appeared to be dependent upon the interval of storage but independent of the heat-treatment (time or temperature of heating) applied. One series of heat treatments, in which the moisture content of the seed was reduced to various levels within the range of 20% to 16%, resulted in an improvement in storage quality in all samples heated at 120°, 140°, and 160° F. for all time intervals except 30 minutes at 160° F. That is, free fatty acids formed more slowly in these samples than in the unheated control. Seven weeks later a second series similar to the first was set up. In this series free fatty acids formed more slowly in the unheated control than in any of the heated lots. Seed stored under the same conditions after it had been dried without heat to 16% (the lowest moisture level produced by heat-treatment) showed no improvement in storage quality as compared with heated seed. A significant reduction in viability occurred in all lots of seed during storage, but germinability was maintained longer in samples which had the lowest moisture content. When the moisture content of the seed was reduced from 20% to 12% by air-drying and the dried seed was stored anaerobically, germinability was not reduced until after storage for 6 months and a 2% increase in free fatty acids was observed. It is indicated that, under anaerobic conditions at 80° F., the limiting factor for safe storage may be the moisture content of the seed.

On Naturally Moist Seed of 14% Moisture Content. Heat-treatments, identical to those used on high-moisture seed, were applied to seed of 14% moisture content 5 months after harvest, approximately the time for planting cottonseed. During the interval between harvest and heat-treatment the seed had been kept in cold storage at 36° F. Measurement of the free fatty acids content indicated no effect of heat on this seed characteristic, confirming the results enumerated for the immediate effects of heat on seed of 20% moisture content. Oxidation-reduction potential determinations again appeared correlated with viability of the seed. Heat at 160° F. for 10 minutes, applied without a reduction in moisture content, did not destroy viability in the low-moisture seed as it did in the high-moisture seed. For all time intervals—10, 20, and 30 minutes—heat at 140° F. applied without a reduction in moisture content improved germinability in seed of 14% moisture content, but, at this temperature, only heat for 10 minutes increased the germination count in the high-moisture seed. When applied with a reduction in moisture content, heat at 140° F. improved viability in one series, but had no effect on the second series of low-moisture seed. These same heat-treatments delayed and reduced germination in the high-mosture seed. No effects of heat at 100° and 120° F. were noted on the viability, confirming the results obtained with seed of 20% moisture content.

On the basis of these results it would seem that the critical temperature, that at which damage to the seed begins, is between 120° and 160° F. It may be that the range in temperature over which damage can occur is much smaller than would appear here. An effort is being made to determine if such is the case by applying temperatures of 130°, 140°, 150°, and 160° F. for the various time intervals to freshly harvested naturally moist seed of the 1951 crop. The immediate effects of heat will be determined and also its effects when applied before storage on the storage qualities of the seed. Since it was possible to improve germinability in high-moisture seed, immediately after harvest and in relatively low-moisture seed just before planting time, it remains to be determined whether an improvement in germinability brought about by a heat treatment applied soon after harvest can be maintained until planting time.

• **Effect of Fungicides**—The effects of fungicides on the seed characteristics, spontaneous heating, viability, oxidation-reduction potentials, and the development of free fatty acids—paralleling somewhat the experiments on the application of heat—have been determined. Naturally moist seed has been used when the development of spontaneous heating was being measured. A limited number of fungicides were

(Continued on Page 84)

BARCO

All Formulations
and
All Combinations of
Cotton Poisons

DDT	Aldrin
BHC	Dieldrin
Toxaphene	Parathion
Chlordane	Tepp
Heptachlor	Lindane

BARCO CHEMICALS, Inc.
67 Butner Street
DES MOINES 15, IOWA

Conference Report

(Continued from Page 67)

defoliants, and rates and methods of application will be found in the Annual Report of Progress from the Cotton Defoliation Conference, issued by the National Cotton Council of America, Memphis, Tenn. This report contains information concerning the influence of plant activity, stage of maturity, and effects of enviroment on efficiency of the process. The report gives details relative to the various needs and benefits and explains how loss in yield and quality of products may be caused by improper timing of the applications.

These guides to the use of the defoliation process are based on broad ecological areas, rather than on State boundaries. When an individual has any doubt concerning proper methods, time of application, or actual need for the process, he should consult local agricultural specialists.

Cotton Insects

• **Boll Weevil** — The boll weevil, *Anthonomus grandis* Boh., may be effectively controlled with benzene hexachloride, calcium arsenate, toxaphene, aldrin, heptachlor and dieldrin. Benzene hexachloride should be applied at a rate of not less than 0.3 pound of the gamma isomer per acre, calcium arsenate at 7 to 10 pounds per acre, toxaphene at 2 to 3 pounds of the technical material per acre, aldrin at 0.25 to 0.75 pound of the technical material per acre, heptachlor at 0.25 to 0.75 pound of the technical material per acre, and dieldrin at 0.15 to 0.5 pound of the technical material per acre. When these insecticides are used for boll weevil control under field conditions, other insect problems have to be considered. Infestations of the cotton aphid, the bollworm, and spider mites may develop when some of these insecticides are used alone.

The following dusts have been approved for use in areas where recommended:

1. Benzene hexachloride to give 3 percent of the gamma isomer in the finished dust plus 5 percent of DDT (sometimes referred to as "3-5-0").
2. Calcium arsenate applied alternately with calcium arsenate plus 2 percent of nicotine.
3. Calcium arsenate applied alternately with a mixture of benzene hexachloride (3 percent gamma isomer) and 5 percent of DDT.
4. Lime-free calcium arsenate plus 1 percent of parathion.
5. Lime-free calcium arsenate plus 1 percent of parathion and 5 percent of DDT.
6. Toxaphene 20 percent.
7. Aldrin 2.5 percent.
8. Aldrin 2.5 percent plus 5 percent of DDT.
9. Heptachlor 2.5 percent.
10. Heptachlor 2.5 percent plus 5 percent of DDT.
11. Dieldrin 1.5 or 2.5 percent.
12. Dieldrin 1.5 or 2.5 percent plus 5 percent of DDT.
13. Chlordane 10 percent plus 5 percent of DDT. (This mixture is recommended only in areas where it has given good control. It has given erratic results in some areas, perhaps because of high temperatures and humidity.)

In areas where spider mites are a problem, dust formulations of organic insecticides should contain sulfur or some other suitable miticide. Where DDT is added to any of the above mixtures it is for bollworm control.

The following treatments with sprays made from emulsion concentrates have given favorable results and are approved where recommended:

1. Toxaphene at the rate of 2 to 3 pounds of the technical material per acre.
2. Toxaphene and DDT in the ratio of 2 to 1 applied at the rate of 2 to 3 pounds of technical toxaphene per acre.
3. A mixture to give 0.3 to 0.5 pound of the gamma isomer of benzene hexachloride and 0.5 pound or more of technical DDT per acre.
4. Aldrin at the rate of 0.25 to 0.75 pound of the technical material per acre.
5. A mixture to give 0.25 to 0.75 pound of technical aldrin and 0.5 pound or more of technical DDT per acre.
6. Heptachlor at the rate of 0.25 to 0.75 pound per acre.
7. Heptachlor at the rate of 0.25 to 0.75 pound per acre plus 0.5 pound or more of the technical DDT per acre.
8. Dieldrin at the rate of 0.15 to 0.5 pound of technical material per acre.
9. A mixture to give 0.15 to 0.5 pound of technical dieldrin and 0.5 pound or more of technical DDT per acre.
10. In areas where it has proved satisfactory and where it is recommended, a mixture of 1 pound of technical chlorane and 0.5 pound or more of technical DDT per acre may be used.

Control measures directed against the boll weevil should be applied when definite need is indicated. Except where

(Continued on Page 75)

A Good Rule to Follow in '52 . . . Write, Wire or Telephone

SAWAN for COTTONSEED

and all related items

Dixie Supreme Acid-Delinted Cottonseed

Empire Pedigreed Cottonseed • Certified Cottonseed

Cotton Poisons • Cotton Dusters

Calkins Slurry Treaters • Ceresan

Fast, dependable service from 2 strategic locations:

COLUMBUS, MISSISSIPPI
Telephone L. D. 1398

ATLANTA, GEORGIA
690 Murphy Ave., S. W.
Telephone L. D. 187

Also make Sawan your headquarters for Field and Garden Seed

APPROVED Sawan INCORPORATED QUALITY

WHOLESALE SEEDS & ALLIED LINES

COTTON'S *Beneficial* INSECTS

It Will Pay Farmers to Know Them and Protect Them

■ **THERE IS STILL much to learn about the relationship between beneficial and injurious insects. We do know, however, that injurious insects usually precede beneficial insects into fields. Generally, therefore, it is advisable to practice early season control to kill injurious insects before the beneficial ones come in.**

But it is essential in most cases to stop poisoning when squares are about one-third grown, or 30 days before the bollworm usually appears. This 30-day period gives beneficial insects a chance to build up.

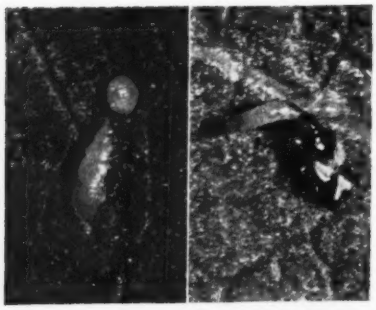
Some of the more important beneficial insects are pictured in color on the following three pages. Farmers should know what these friendly insects look like. We can increase their effectiveness by applying poison to control the injurious pests at the right time.

☆

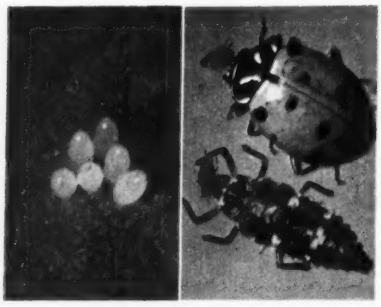
The Cotton Gin and Oil Mill Press

3116 Commerce Street • P. O. Box 444 • Dallas 1, Texas

Cotton's Beneficial Insects



FLOWER BUG (Orius). Left: nymph feeding on bollworm egg. Right: adult (3/32" actual size) feeding on bollworm larva. (The nymph stages of all insects vary in size.)



LADY BEETLE (Lady Bird Beetle). Left: eggs deposited on cotton leaf. Right, adult (¼" actual size) and larva feeding on aphid. (The larval stages of all insects vary in size.)

WHEN INSECTS steal our crops, they also take our profits. Many farmers already know how to identify cotton's *injurious* insects and make counts. But it is equally important that farmers learn to identify cotton's *beneficial* insects. Once farmers are able to recognize cotton insects—both good and bad—they are well on the way to successful cotton insect control . . . they then know better when and where to use poison.

Injurious insects usually precede beneficial insects into cotton fields. This is easily understood. Injurious insects are the food or host for the good bugs. For this reason, *early season control* with poison is strongly advocated in areas where thrips, aphids, fleahoppers, or boll weevils cause damage every year. When early season poisoning is completed ahead of blooming, injurious insects will be killed and the number of blooms increased. Cotton blooms attract many insects, including the beneficial ones. Thus, where early season control is properly applied there may actually be more beneficial insects in the field when bollworms appear than would be the case if no poison were used.

Our first job is to practice farming methods that hold insect populations down. Next step is to poison to kill *injurious* insects with the least harm to *beneficial* insects. When these steps are followed, a lot of poison and expense are saved and more profitable cotton production should result.

• **We Have Much to Learn**—Entomologists realize that there is still a lot to learn about the relationship between beneficial and harmful insects. We know that boll weevils, pink bollworms and stink bugs do not have enemies capable of keeping them under control. And damaging infestations of aphids, thrips, fleahoppers, leafworms, bollworms and other harmful insects often develop before beneficial insects can reduce their numbers. When this happens, it is time to start poisoning.

For the first time, we are able to show you some of the more important beneficial insects in color. Thanks for this fine contribution to more effective cotton insect control are due several people. Howard Berry, director, Photo and Visual Aids Laboratory, Texas A. & M. College, photographed them. Members of the Entomology Department of the College, and E. E. Ivy, entomologist, of USDA's Bureau of Entomology and Plant Quarantine, were responsible for collection and identification of these insects, and for information about their life history.

• **Two Groups of Friendly Insects**—What insects are the cotton growers' friends? They fall into two groups: (1) Predators, and (2) Parasites. Predators catch and devour smaller or more helpless creatures, usually killing them in getting a single meal. Parasites make their homes on or in the bodies of other insects. From them the parasites get food during at least one stage of their existence. The hosts are usually larger and stronger than the parasites. They are not killed promptly but continue to live for awhile in close association with the parasites. Predators are typically very active and have long life cycles. Parasites are usually sluggish and tend to have very short life cycles.

Beneficial insects most helpful to cotton growers throughout the Belt are pictured on these pages. They vary in importance in different sections of the Belt, some being more numerous and therefore more beneficial in one area than in another. In addition to the beneficial insects shown, we are discussing briefly a number of predators that may be important in one state or area but seldom seen in another.

We find that some of these insects do business under different names. Maybe you know them under names that are not generally used in other states. We are, therefore, giving the common names that have been suggested by entomologists throughout the Cotton Belt.

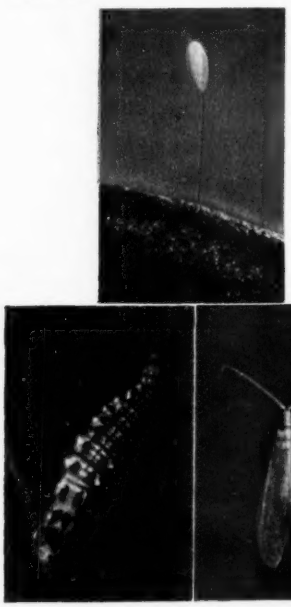
MAJOR BENEFICIAL INSECTS

The Predators

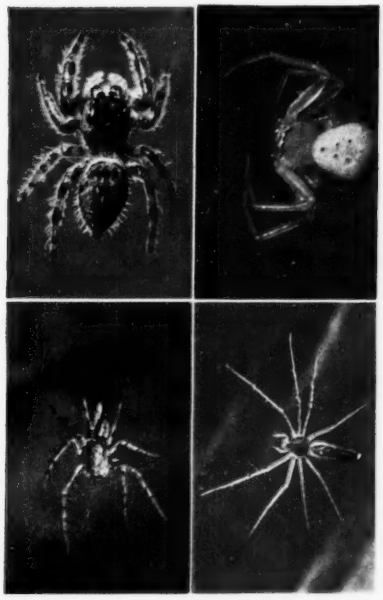
FIRST, LET'S LOOK at the pictures and talk about the predators of greatest importance. They include Flower Bug or Orius, Lady Beetle, Lace-Winged Fly or Aphid Lion, Sweat Fly or Syrphid Fly, Spiders, Assassin Bugs, and Wasps.

Flower Bug or Orius (also known as Insidious Flower Bug and Minute Pirate Bug). This small but aggressive insect is generally considered the most beneficial of all predators attacking injurious cotton insects. They are abundant, widely distributed and have big appetites. And these tiny scrappers seemingly have no fear of the size of injurious insects. Both the nymph and adult are active feeders. They can be readily found in fields after cotton starts blooming. They attack aphids, red spiders and thrips. And they also eat the eggs

LACE-WINGED FLY (Aphid Lion). Top: egg on slender stem attached to cotton leaf. Bottom left: larva, also known as Aphid Lion, feeding on aphid. Bottom right: adult (7/16" actual size.)



Cotton's Beneficial Insects



SPIDERS. Four kinds often found in cotton fields (1" or less actual size.)

and larvae of cutworms, bollworms, armyworms and leafworms, and the nymphs of the fleahopper, lygus and rapid plant bug. This aggressive little bug is really the farmer's friend and should be looked after carefully.

Lady Beetle (also known as Lady Bug, Lady Bird, and Lady Bird Beetle). Most everyone knows this friendly insect and it is about the only good bug that many farmers can identify. There are many kinds of lady beetles of varying colors and markings that are found in abundance wherever cotton is grown. Both the larvae and adult stages are beneficial. They attack aphids, red spiders, and destroy the eggs and larvae of the bollworm, cotton square borer and leafworm. Other soft-bodied creatures and their eggs are also their prey. Look on the underside of the cotton leaf for their orange eggs in small masses of a dozen or two. The individual eggs will be found on end in contact with each other. They should not be destroyed.

Lace-Winged Fly or Aphid Lion. This is another predator of major importance. There are both green and brown lacewinged flies. Abundant and widely distributed, this insect is more beneficial in the larval stage. However, the adult is known to destroy bollworm eggs. The greenish-white eggs of the lace-winged fly are placed on slender stems attached to the leaves or stems of plants. The spindle-shaped larvae are very active and have long, sharp-pointed jaws. They grasp and puncture the bodies of aphids or other small, soft insects and their eggs. They feed on aphids, red spiders and thrips. The eggs and larvae of armyworms, bollworms, cutworms, and leafworms are also destroyed by them.

Spiders of many species are found in cotton fields. Most of them are harmless to man and are exceedingly beneficial. There are no species injurious to crops. They snare and eat most of the injurious insects that attack cotton. Don't confuse these larger beneficial spiders with the small red spider mites that *damage* cotton plants.

Sweat Fly or Syrphid Fly. In humid areas, this insect is just about as important as the lady beetle and aphid lion. Only in the larval stage do they kill injurious insects. Look for them in aphid colonies. They are footless, slug-like, tan, or greenish maggots. They suck out the body content of aphids, leaving only the empty skin. Cotton farmers find them a big help in keeping down aphids or lice.

Assassin Bugs include many species and are of major importance. They are our good friends but not many of any one species can be found in cotton fields. Both nymph and adult feed on the larvae and adults of injurious insects with the possible exception of aphids, thrips and red spiders.

Wasps are numerous and widespread. The adults feed on armyworms, cutworms, leafworms, and the larvae of other insects. They may also carry them to their nests to feed their own young.

The Big-Eyed Bug does his best work in western alfalfa growing areas. Both adults and nymphs prey upon young bollworm and cotton leafworm larvae. They also feast upon cotton fleahoppers and plant bugs of various kinds. Big-eyed bugs build up in enormous numbers on alfalfa, moving to cotton when alfalfa is cut.

Several beetles are good friends of the cotton grower in certain areas of the Belt.

Ground Beetles are of greatest importance on bottom lands and in damp areas. Both the larvae and adult stages are beneficial. They feed on wireworms and the larvae and pupae of leafworms, cutworms, bollworms and similar cotton pests. The adults are black, or brown, long-legged, swift-running, strongly built "caterpillar hunters." During the day look for them under the ground or in other dark, protected places. They hunt chiefly at night and hide during the day.

Checkered Beetle is of secondary importance. This brightly colored insect feeds on pollen and various small insects. It is an important enemy of the bollworm, attacking eggs and young larvae. It also destroys aphids and thrips. You will find the checkered beetle most numerous on cotton late in the season, moving in from alfalfa and similar crops.

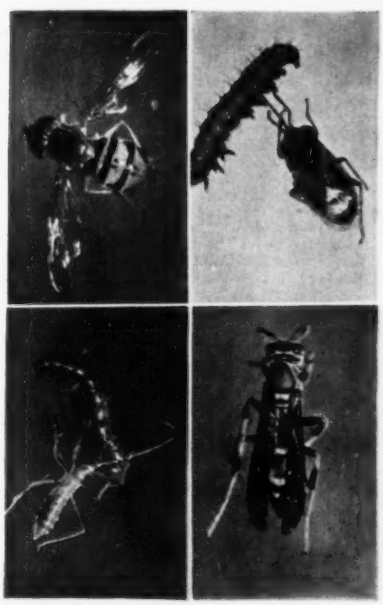
Hooded Beetle is of great importance in the western cotton-growing area. This queer-looking beetle has a roof-like hood projecting over his head. The adults are usually found in the terminals and blooms feeding on the eggs, nymphs and larvae of injurious insects, including thrips, fleahoppers, aphids and bollworms.

The Parasites

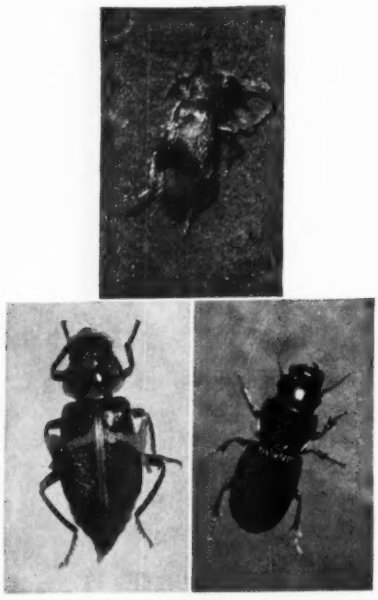
NOW LET'S TALK about the beneficial insects that live as parasites on certain cotton pests.

Aphid Parasite is of great importance. This tiny wasp is widespread. She is often seen moving briskly and efficiently over the leaves of aphid-infested cotton. Now and then she pauses briefly to place an egg in an aphid. In a few days the paralyzed aphid stops feeding, becomes greatly swollen and gray or straw-colored, then dies. In a few more days the mature parasite emerges through a circular hole in the body

IMPORTANT GROUP of predators found in cotton fields. Top left: Sweat Fly or Syrphid (¼" actual size). Top right: Big-Eyed Bug (5/32" actual size) feeding on bollworm larva. Bottom left: Assassin Bug (Zelus) nymph feeding on bollworm larva. Bottom right: one of the most common kinds of wasps (common wasps range from ¾" to 1¼" actual size.)



Cotton's Beneficial Insects



BEETLES. Three kinds found in certain areas of the Cotton Belt. Top: Hooded Beetle (3/16" actual size). Bottom left: Checkered Beetle (5/16" actual size). Bottom right: Ground Beetle (½" actual size.)

of the aphid. Some species of these parasites are even smaller than the specimen shown. This parasite completes its entire development inside bollworm or cotton leafworm eggs.

Tachina Fly belongs to one of the most important families of parasites. Many resemble overgrown house flies, but their habits are very different. They are usually grayish, brownish, or black-mottled flies, without bright colors. Adults are usually found resting on foliage or about flowers upon which they feed. They may often be seen attacking caterpillars. The egg soon hatches into a maggot, which completes its development as a parasite inside of its victim. Some species of tachina flies deposit living maggots. Upon hatching, the maggots tunnel directly through the skin. Within a short time they often have killed caterpillars by thousands. Whenever armyworms become abundant, you will see great numbers of flies buzzing about. Farmers sometimes think that flies make the armyworms. But flies are one of their principal natural enemies. They have been known to wipe out leafworm infestations.

Ichneumon Wasps are a family which includes the largest-sized parasites as well as some very small ones. The specimen pictured is one of the largest of the group. They are often brilliantly marked. When active, they can generally be recognized by their short, jerky flight and constantly vibrating antennae. They deposit their eggs and complete their development inside the injurious insect and come out as adults. These parasites are especially destructive of cotton leafworms, bollworms, cutworms, armyworms and similar cotton pests. They have been known to wipe out an invasion of these insects in a short time. Last year, this parasite did much to reduce the number of green loopers that developed in alfalfa and clover.

Boll Weevil Parasite. Unfortunately, boll weevil parasites do not become numerous until rather late in the season. It is then too late for them to help us much. Their principal value is from the reduction of weevils that go into hibernation. This remarkable insect acts as if it were equipped with radar. It can be seen crawling rapidly over cotton bolls and squares, tapping with its antennae. When a boll weevil larvae is located in a boll or square she pauses and unerringly deposits an egg in the unsuspecting host. In a few days an adult parasite emerges from the boll or square, ready to carry on the good work.

MINOR BENEFICIAL INSECTS

IN ADDITION to the beneficial insects we have pictured, there are several other friendly bugs of less importance.

Robber Fly is never found in large numbers. This fellow can be seen in the cotton field descending like a bolt from the blue upon some hapless bollworm or cotton leafworm moth. It also kills bollworm and cotton leafworm larvae, as well as other caterpillars and worms. It sucks the juices out of about anything it can catch. And it can catch just about anything it goes after.

Devil's Horse looks like some monster from the prehistoric past. It is also called the praying mantis because of its habit of holding its forelegs folded in a prayer-like attitude. The "old boy" will hold this pose for hours at a time. But let some unwary insect victim wander by. Then watch out! The pious, folded hands flash open to show needle-sharp spines, which lash out to seize the helpless victim. He feeds on grasshoppers, moths, and larvae of different kinds.

Mantispid is an odd-looking insect and can be recognized by its remarkable forelegs. They are greatly enlarged and resemble those of the devil's horse. These legs are fitted for seizing prey. Mantispidae seize plant bugs with their large forelegs and feed on them. They also feed upon larvae of different kinds. Unfortunately, though, they are not very common.

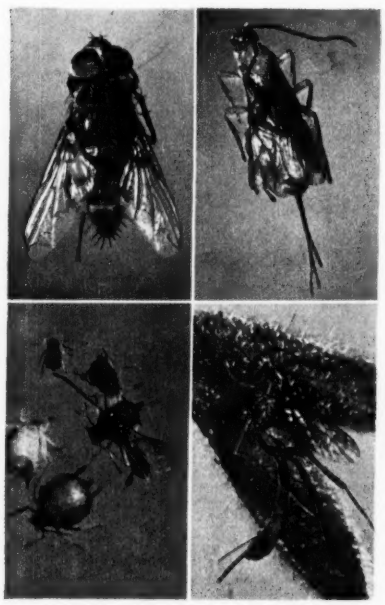
Rice Stink Bug is a regular Dr. Jekyll and Mr. Hyde. He and some of his relatives are extremely injurious to rice, grain sorghums, small grains, fruits and garden vegetables. Stink bugs also damage green cotton bolls. But at the same time some of them destroy many injurious cotton pests, especially bollworms and cotton leafworms. On the whole, we would probably be better off without this two-timing friend. But we feel like giving the devil his due, so it is listed as an insect friend of the cotton farmer.

Ants. Certain kinds of ants destroy boll weevil grubs in squares on the ground. Others are harmful. They protect aphids and also prey on some of the beneficial insects that destroy aphids.

Six-Spotted Thrip. Louisiana and California cotton folks tell us that this insect is the cotton farmer's friend. They destroy red spider eggs.

Nabid or Damsel Bug. This insect preys on many insects, both beneficial and injurious, including aphids.

PARASITES. Four important species found in cotton fields. Top left: Tachina Fly (¼" actual size). Top right: Boll Weevil Parasite (⅛" actual size). Bottom left: Aphid Parasite (1/16" actual size) and parasitized aphids. Bottom right: Ichneumon Wasp (5/16" actual size.)



(Continued from Page 70)

early season control measures are practiced, insecticides should be applied at intervals of 4 to 5 days until the infestation is brought under control. Thereafter, the fields should be inspected weekly and applications made when necessary.

• **Bollworms**—At least four species of lepidopterous larvae damage cotton bolls. The most important are the bollworm, *Heliothia armigera* (Hbn.), and the tobacco budworm, *H. virescens* (F.). The yellow-striped armyworm, *Prodenia ornithogalli* Guen., and fall armyworm, *Laphygama frugiperda* (A. & S.), are the others that sometimes cause boll injury. The tobacco budworm is the predominant species in many collections of bollworms from cotton, particularly in the eastern part of the Cotton Belt.

It is often a difficult task to control this group of insects and many erratic results have been reported. Factors which contribute to their abundance are sometimes complex and not too well known. The widespread use of certain of the organic insecticides has often resulted in greatly increased bollworm damage, presumably as a result of killing off the natural enemies. Probably, also changing farm practices due to diversification and mechanization have resulted in conditions more favorable for the normal increase of these insects.

Effective bollworm control depends on the use of properly formulated insecticides and timeliness and thoroughness of application. Frequent field inspections during the main fruiting period of cotton in any given field to determine the presence of eggs and young larvae are prerequisite to satisfactory bollworm control. After the larvae have already entered the squares and bolls it is too late for effective control.

DDT is the most effective insecticide known for the control of bollworms. For heavy bollworm infestation it should be applied at the rate of 1.0 to 1.5 pounds of the technical material per acre in the form of a 10 percent dust or as a concentrated spray. DDT may be used in mixtures with other insecticides where other insects as well as bollworms require control. It is compatible with lime-free calcium arsenate but not with regular calcium arsenate. Where 0.5 pound or more of DDT per acre is applied with BHC, aldrin, dieldrin, or heptachlor in the regular schedule for boll weevil control, bollworms are usually controlled.

Toxaphene, at the rate of 2 to 4 pounds per acre, is the next most effective insecticide against bollworms. This may be applied as a 20 percent dust or as a spray. The addition of DDT to toxaphene dust or spray has greatly improved the effectiveness of this insecticide for bollworm control.

Calcium arsenate and cryolite dusts are less effective.

In areas where spider mites are a problem, dust mixtures containing organic insecticides used for the control of bollworms should include 40 percent of sulfur or an appropriate amount of some other suitable miticide.

• **Cotton Aphid**—Heavy infestations of the cotton aphid, *Aphis gossypii* Glov., often occur on cotton after the use of certain insecticides. Infestations may also be severe on seedling cotton where no insecticides have been applied.

The following treatments, when used for other cotton insect control, will usually prevent an aphid build-up:

1. A mixture containing 3 percent of the gamma isomer of benzene hexachloride and 5 percent of DDT in every application at the rate of 10 to 12 pounds per acre.

2. A mixture containing 3 percent of the gamma isomer of benzene hexachloride and 5 percent of DDT at the rate of 10 to 12 pounds per acre in alternate applications with calcium arsenate.

3. Nicotine 2 percent in regular calcium arsenate at the rate of 10 to 12 pounds per acre alternated with calcium arsenate alone.

4. Parathion 1 percent in lime-free calcium arsenate dust or 1 percent in dust or 0.1 pound per acre in spray added to aldrin plus DDT, dieldrin plus DDT, heptachlor plus DDT, or toxaphene plus DDT will effectively control the cotton aphid when any of these mixtures are used at the recommended rate for boll weevil control. However, parathion should be used only by those who are qualified to handle such dangerous materials.

5. Toxaphene at the rate of 2 to 3 pounds of the technical material per acre in every application (where toxaphene is not formulated with DDT).

When heavy infestations of the cotton aphid occur and where the need for rapid kill is indicated, the following treatments are effective:

1. Benzene hexachloride applied to give 0.5 pound of the gamma isomer or an equivalent amount of lindane per acre.

2. Parathion applied either as a dust or spray at a rate of 0.1 to 0.25 pound per acre of technical material.

3. Nicotine 3 percent in hydrated lime applied at the rate of 10 to 15 pounds per acre.

4. Forty percent tetraethyl pyrophosphate applied at 0.5, or its equivalent, per acre. The effectiveness of this material is of short duration.

• **Cotton Fleahopper**—The cotton fleahopper, *Psallus seriatus* (Reut.), can be controlled with the following dusts: DDT 5 percent, toxaphene 10 percent, dieldrin, 1.5 percent, aldrin 2.5 percent, heptachlor 2.5 percent, benzene hexachloride (gamma isomer 1 percent), and chlordane 2 percent. When spider mites are likely to be a problem, 40 percent or more of sulfur or an appropriate amount of some other suitable miticide should be added to organic insecticide formulations.

The following materials applied as low-gallonage sprays at the rates indicated per acre will give good control of the cotton fleahopper; 0.5 pound of DDT, 1 pound of toxaphene, 0.5 pound of toxaphene plus 0.25 pound of DDT, 0.1 pound of dieldrin, 0.2 pound of aldrin, 0.2 pound of heptachlor, or 0.5 pint of 40 percent tetraethyl pyrohosphate.

• **Cotton Leafworm** — The cotton leafworm, *Alabama argillacea* (Hbn.), has been controlled successfully for many years by calcium arsenate, paris green, or lead arsenate. Dust and spray formulations of benzene hexachloride, toxaphene, a mixture of benzene hexachloride and DDT, or a mixture of toxaphene and DDT are effective in controlling the cotton leafworm.

• **Cutworms** — Cutworm outbreaks may develop in weeds or crops, especially legumes. Cutworms migrate to adjacent cotton or attack cotton planted on land previously in weeds or legumes.

Recommended control measures are thorough seed-bed preparation, elimination of weed host plants, and use of insecticides. If the need for insecticides to save the stand is to be avoided, allow at least three weeks to elapse between the time of plowing under an infested area and the subsequent seeding of the cotton crop. Toxaphene and toxaphene-DDT sprays applied at a rate of 2 to 3 pounds per acre, DDT spray at 1 to 1.5 pounds per acre and dieldrin at 0.375 to 0.5 pound per acre are effective. Twenty percent toxaphene or 10 percent DDT dusts applied at rates of 10 to 15 pounds per acre will give satisfactory control. Poison baits containing paris green, sodium fluosilicate or toxaphene have been found satisfactory. A poison bait consisting of 40 percent of cryolite and 60 percent of citrus meal gives effective control.

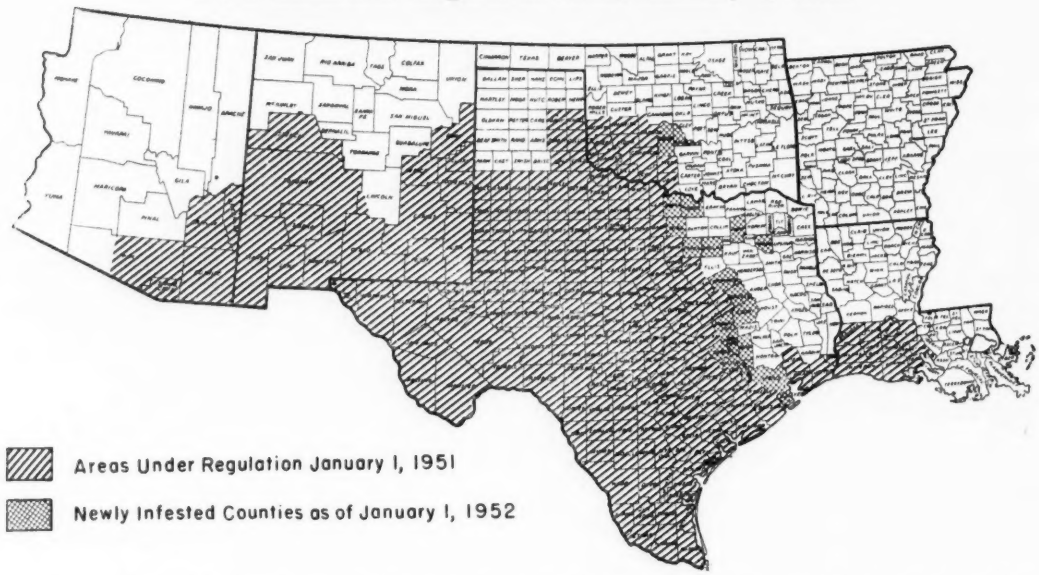
• **Fall Armyworm**—The fall armyworm, *Laphygma frugiperda* (A. & S.), occasionally occurs in sufficient numbers to damage cotton. The following dusts have given good control: toxaphene 20 percent at the rate of 10 to 15 pounds per acre; sufficient benzene hexachloride to give 3 percent of the gamma isomer plus 5 percent of DDT at the rate of 10 to 15 pounds per acre, chlordane 10 percent at the rate of 15 to 20 pounds per acre; or DDT 10 percent at the rate of 10 to 15. A 5 percent DDT dust will control small worms. Toxaphene at the rate of 2.0 to 2.5 pounds per acre or DDT applied at the rate of 0.5 to 1.0 pound of the technical material per acre in sprays have given good control. Other insecticides that have been effective when applied as sprays are: dieldrin 0.15 to 0.30 pound of technical material per acre; benzene hexachloride containing 0.40 to 0.60 pound gamma isomer per acre; and aldrin 0.25 to 0.50 pound of technical material per acre. The results obtained from the above materials have varied in different states, therefore, local recommendations are advisable. (Also see Bollworms.)

• **Garden Webworm**—The garden webworm, *Loxostege similalis* (Guen.) may be controlled on cotton by dusts containing 5 percent of DDT plus sufficient benzene hexachloride to give 3 percent of the gamma isomer, 20 percent of toxaphene or 10 percent of DDT Good control of this insect may be obtained with toxaphene, toxaphene plus DDT, DDT, and dieldrin sprays. DDT has given better control in sprays than in dusts and is generally less effective than

Quotes From Our Authors:

"IN 1950, the year in which pest damage set an all-time record, the Mississippi Agricultural Extension Service estimates that farmers gained an additional $93 million by poisoning wisely."

Pink Bollworm Regulated Area, January 1, 1952



the other listed materials. Calcium arsenate may also be used to control the garden webworm, but heavy poundages are required and control is generally less satisfactory than with the new organic insecticides.

• **Grasshoppers** — Several species of grasshoppers, particularly *Melanoplus differentials* (Thos.) and *Schistocerca americana* (Drury), attack cotton. The adults of *S. americana* hibernate and deposit their eggs in the fields, but most of the other species overwinter as eggs in untilled soil in fence rows, sod waterways, around stumps, and in similar locations. The latter can best be controlled by early teratment of hatching beds before the grasshoppers migrate into the fields. Sprays or dusts containing aldrin, chlordane, dieldrin, toxaphene, or benzene hexachloride are rapidly replacing poison baits for grasshopper control in many areas. This is particularly true where grasshoppers must be controlled on lush or dense vegetation.

Benzene hexachloride sprays and dusts usually produce a spectacular kill of the grasshoppers in a few hours, but results have been erratic and residual effectivenss is limited to 1 or 2 days. Aldrin, chlordane, dieldrin, and toxaphene are very effective but are slower in their action. They remain residually effective for 5 to 14 days, however, depending on prevailing environmental conditions.

Dosages suggested to control grasshoppers fall within the following range:

	Pounds per acre
Aldrin	0.1-0.25
Benzene hexachloride, gamma isomer	0.3-0.5
Chlordane	0.5-1.5
Dieldrin	0.07-0.125
Toxaphene	1.0-2.5

The lowest dosage rates suggested are effective against newly hatched to half-grown grasshoppers. The dosage should be increased as the grasshoppers mature or when the materials are applied on partly defoliated plants or on plants that are unpalatable to the insects.

Baits made according to State and Federal recommendations still have a place in grasshopper control where treatment of extensive areas is required, particularly in sparse vegetation.

• **Pink Bollworm**—Methods of controlling the pink bollworm, *Pectinophora gossypiella* (Saund.), include destruction of cotton stalks immediately after the harvest, heat treatment of cottonseed, burning of gin waste, compression of lint, and the application of dust and spray formulations. In South Texas pink bollworm infestations early in any season are in proportion to the number of these insects that survive the period between crops. The longer this period the fewer insects will survive; therefore, the number of overwintering insects may be reduced by destroying cotton stalks at the earliest possible date. The best procedure is to cut the stalks with one of the new type rotary shredders. These machines kill a considerable percentage of the pink bollworms during the shredding operation. They shatter and spread the bolls on the ground so evenly that a higher kill is obtained by action of the sun, if done when temperatures are high, and also permit a more thorough coverage of the residue during the plowing operation. The roots should be plowed out promptly and the crop debris plowed under. All seedlings or sprouted cotton plants developing after the plowing should be eliminated before fruiting so as to create a long host-free period between crops. For best results cultural practices should be carried out on an area-wide basis and the cooperation of every cotton grower is needed. Cultural practices used to control the pink bollworm will also control the boll weevil.

Cotton growers of the Lower Rio Grande Valley of Texas have used the cultural method of control outlined above and, over a 5-year period, lint production averaged 342 pounds per acre. Over a 5-year period prior to the beginning of control by early stalk destruction, lint production there averaged 213 pounds per acre. This increase in yield at prices prevailing during 1950 harvest amounted to around $17,000,000 for the 1950 crop from about 375,000 acres.

The increased production resulted largely through prevention of damage by pink bollworm, effective boll weevil control and greater productivity of the soil because of improved farming methods. However, weather conditions during 2 of the past 3 seasons prevented compliance with planting and stalk destruction practices required for pink bollworm control. Damages by the pink bollworm is increasing rapidly. Also far greater quantities of insecticides are now required to control the boll weevil It is expected that for the first time in South Texas and the Lower Rio Grande Valley large quantities of DDT will be required in 1952 to prevent excessive pink bollworm damage in those areas.

There is a progressive build-up in the pink bollworm population as the season advances: therefore, every effort should be made to expedite fruiting and setting the crop. The following practices are recommended for hastening the maturity of the cotton and thereby reducing the pink bollworm infestation: Heat or chemical treatment of planting seed; early uniform planting of quick-maturing varieties; control of cotton

Quotes From Our Authors:

"IN 1951 more than 600 million pounds of death - dealing poison was applied to the (cotton) crop, setting a new record."

From our Washington Bureau

By FRED BAILEY

Washington Representative
The Cotton Gin and Oil Mill Press

• **Arnall: New Mystery Man**—This Ellis Arnall is quite a guy. The new price boss may be still a bit naive in the ways of Washington, but he certainly knows his way around in politics. In several respects he is the Capital's latest mystery man.

Why was the job of Price Administrator offered to him?

Why did he take it? Does he have national political aspirations?

What sort of a price boss will he be? Will he be tough, or will he lean to decontrol?

Despite the fact that Arnall has been around a couple of weeks, there isn't much of a way of getting a line on him. He comes to Washington with a good reputation as governor of Georgia. He made a good impression on Congress. But he still is a mystery man.

There are many things about the appointment that intrigues Washington. It just doesn't add up.

For one thing he is a Southerner, a Deep South Southerner, suh. It has been a long time since a dyed-in-the-wool Southerner was welcomed into the Washington official family.

There has been no official explanation for the appointment of Arnall. If President Truman hoped to lure the South back into the Fair Deal camp, he was not using the right kind of bait.

Arnall comes from a state and a part of the country where Truman's name isn't mentioned in the same breath with Robert E. Lee or Jefferson Davis, not unless one is planning on leaving town by the shortest route.

Besides, a price boss never has rated very high in a popularity poll. It just isn't that kind of a job.

Arnall, as governor of Georgia, never was one of the fair-haired boys in either New Deal or Fair Deal circles. On the other hand, he never was one of those Southerners whom President Roosevelt very tartly described as "unreconstructed rebels." It is said that he always spoke of Washington with polite reserve.

It is known that the price job was offered to at least a dozen men before Arnall said "yes," then almost changed his mind before finally accepting. If he has national political aspirations, those who know him say he showed no signs of it in Georgia. The job hardly could be considered the stepping stone to greater things.

It was when you compare—or contrast—Arnall with his predecessors in the price job, including the OPA era, that he stands out as an unusual, if not a remarkable, man in the Washington scene.

Price administrators in the past have generally been of pretty much the same breed. In OPA there was Leon Henderson, who rode his secretary to work in the basket of his bicycle; Paul Porter, who was a political opportunist looking for something better; and Chester Bowles, who certainly won no popularity contests while he was OPS administrator.

None of those wore well with Washington. They made enemies almost as fast as they lost friends. Generally their official careers came to an untimely end, with the public howling for their scalp.

Mike DiSalle, though, was a real puzzler. He is a nice guy, personally and socially. A jolly chap that you just had to like in every way except his official capacity. He could make an amusing and delightful speech. He kept his temper under perfect control and criticism didn't seem to rile him a bit.

Those who differed with DiSalle most on price policies sometimes got mad simply because they couldn't, whatever they said, make him angry. DiSalle, unlike his OPA predecessors, made friends in Washington, personal friends that is.

Arnall is no shrinking violet, but we are told that he is thin-skinned. It doesn't take too much to get his Southern blood to the boiling point, we hear. Probably, if that is true, he will find that Washington is not a good place to lose his temper.

• **No Promise of Decontrol**—There is a lot of decontrol talk going on in Washington, but there is no foundation for rumors that Arnall is the cause of it, or that he is in sympathy with the more rabid decontrol advocates.

No one here believes that Arnall, the President's personal choice for the job, was brought in to mastermind decontrol. Almost certainly Mr. Truman didn't have that in mind when he picked him.

You couldn't blame congressmen for being suspicious when Arnall's nomination was sent to the Senate for confirmation. They turned the heat on him as only a tough congressional committee can, in search for an explanation for his appointment. They found none, but they liked the man and the way he handled himself.

He seemed willing enough to talk about decontrol, but carefully avoided promising it. He said he was for decontrol as a general idea, but he refused to be specific on when or how.

Most of the farm groups want decontrol, but they differ on when and how. The Farm Bureau and the National Council of Farmer Cooperatives want a "sudden death" end to both price and wage controls on June 30. The National Grange says farm prices should be decontrolled "whenever the supply is equal to demand at a reasonable price." When a supply is short of demand, it wants price control and rationing together.

About the only thing you can be sure of right now is that Congress will be up to its ears in a slam-bang battle over controls right down to the June 30 deadline for renewal of the Defense Production Act.

• **Taft: Fence Rider?**—This is open season, politically, in Washington, so we went around to Sen. Robert Taft's campaign headquarters here to find out how he stands on some things farmers are especially interested in. What we found was Taft astride the first political fence we've seen this spring.

We were shown an item in the Congressional Record of recent date purporting to give Taft's views. Whether or not it is libelous is beside the point, since anything that appears in the record is exempt from the libel laws.

To quote from the Congressional Record:

"Taft believes price supports are required, but on a flexible basis, and probably fixed from time to time by an agricultural board. Such supports should be moderate, large enough to protect the farmers' purchasing power, but not so large as to encourage overproduction.

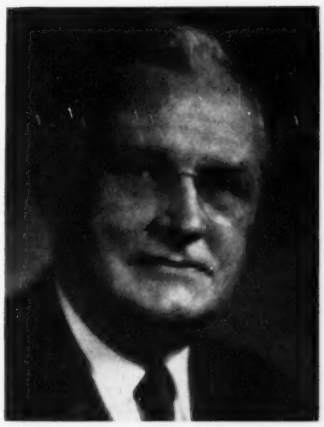
"He opposes Government production control measures, but has conceded that in an emergency such controls might be required.

"He opposes a guaranty to farmers of 100 percent of parity, though he believes government policy ought to aim toward that price.

"He supports the cooperative movement, though he thinks there is some risk that it may become too powerful.

"He supports rural electrification, though he thinks there is no justification for government loans where electric power is already available at a fair price."

You figure it out. We can't.



Cattlemen Will Hear Ward

A. L. WARD, director of the NCPA Educational Service, will speak at the twenty-second annual meeting of the Louisiana Cattlemen's Association at Lake Charles, March 20-21. George L. Gayden, Jr., Gurley, president of the association, expects about 300 cattle raisers to attend. Livestock and agricultural leaders from Louisiana and other states will appear on the program. Dalton E. Gandy, Mississippi Valley field representative of the Educational Service, has taken an active part in the work of the cattlemen's group for a number of years.

fleahoppers, thrips, aphids, and other insects that delay fruiting; clean cultivation; elimination of late irrigation; and chemical defoliation.

In cold, arid regions, such as the West Texas Area where the harvest must be completed after frost, as many bolls as possible should be removed by snapping, mechanical harvesting, or by heavy pasturing. The cotton stalks should be left standing during the winter months, since the highest mortality of hibernating pink bollworm larvae in such areas is obtained in the bolls on standing stalks. Where the stalks are plowed under early in the winter the fields should be winter irrigated wherever possible.

Larvae of the pink bollworm enter mature cottonseeds to feed and to hibernate. To prevent the overwintering or spread of the insect, cottonseed are given a heat treatment as a continuous process of ginning in much of the pink bollworm quarantined area. In the remainder of the area, cottonseed are heat-treated upon arrival at designated oil mills or other treating plants. In the heavily infested areas a second heat treatment is required before movement into other quarantined or free areas. In all pink bollworm quarantined areas gin waste is destroyed promptly by burning, or heat-treated for use as a fertilizer, and all lint is compressed before it is moved into the areas that are free of pink bollworm.

DDT continues to be the best insecticide for control of the pink bollworm. It can be applied as a dust or as an emulsion spray. From 1.5 to 2 pounds of technical DDT should be used per acre application. Dust formulations containing 10 percent of DDT should be applied at the rate of 15 pounds per acre. When control of the pink bollworm is essential to prevent damaging buildup and subsequent spread, it is recommended that not less than 2 pounds of technical DDT be applied at 7-day periods. Large-scale demonstration tests, with applications beginning when the cotton is in the 6- to 8-leaf stage, have proved highly effective when followed with later aplications as required by infestation conditions of pink bollworms and other insects. These early applications are especially beneficial in shortening the fruiting period. The result is that fewer generations of pink bollworms develop and early stalk destruction is possible. The number of hibernating pink bollworms is thus reduced.

Aphids and spider mites may develop when DDT is used alone for pink bollworm control. Benzene hexachloride and sulfur or parathion may be added to the dust formulations and TEPP may be added to the spray formulations for control of these pests as recommended.

Regardless of the other insects to be controlled, all formulations for control of the pink bollworm should contain sufficient DDT to give the minimum of 1.5 pounds of technical DDT per application per acre irrespective of the other materials or the spacing of applications.

The accompanying map (page 76) shows the areas under quarantine because of the pink bollworm. Farmers, county agents, ginners, and all others in the cotton industry should cooperate fully with state and federal quarantine agencies in preventing spread of the pink bollworm, especially with regard to the movement of cottonseed from infested areas.

Quotes From Our Authors:

"THE USE OF the new organic insecticides applied as emulsions with low-gallonage, low-pressure spray machines is one of the most outstanding developments in cotton insect control for many years."

• **Spider Mites**—Several species of spider mites are known to attack cotton, including the two-spotted spider mite, *Tetranychus bimaculatus* Harvey, and a recently described species, *Septanychus texazona* McG.

It is known that the use of certain of the organic insecticides for cotton insect control has resulted in serious spider mite infestations.

Sulfur, at the rate of 20 to 25 pounds per acre, has been the standard recommendation for the control of spider mites for many years, and satisfactory results have usually been obtained from its use. In some areas organic insecticide dusts for use on cotton have been formulated to contain at least 40 percent of properly conditioned dusting sulfur. The use of such formulations has usually prevented damage from spider mites.

During recent years other satisfactory miticides have been developed. Some of these synthetic substitutes were widely tested and used in 1951.

Since sulfur is now in critically short supply and since satisfactory substitutes are now available, it is recommended that sulfur be deleted from the local recommendations for control of cotton pests wherever and whenever it is felt that it is feasible to do so.

Parathion applied as a dust or spray at the rate of 0.10 to 0.25 pound per acre is highly effective against spider mites on cotton.

TEPP at the rate of 0.5 pint of the 40 percent concentrate, or its equivalent, per acre, effectively controls heavy populations but its effectiveness is of short duration.

Aramite applied at a rate of 0.3 to 0.6 pound per acre gives good control of spider mites.

Several organic sulphur compounds are known to be more or less effective for spider mite control. These include sulfones, sulfites and sulfonic acid compounds. Erratic results have resulted from the use of these compounds and they are not yet generally recommended.

When the organic insecticides are applied as low-gallonage sprays, elemental sulfur cannot be incorporated in the spray formulations. When sprays are being used and the mite population begins to noticeably increase, aramite, parathion, or TEPP at the above dosages may be added to the next spray application for mite control.

Other compounds tested under field conditions during 1951 which appear sufficiently promising to justify recommendation for experimental use during 1952 are as follows:

(1) EPN at a rate of 0.3 pound or more per acre.

(2) Octamethyl pyrophosphoramide at 0.5 to 1 pound per acre.

(3) Systox at 0.25 to 0.5 pound per acre.

Further experimental work on methyl ester of parathion, metacide, and compound 4049 at 0.25 pound or more per acre is justified.

S. texazona is more susceptible to certain miticides than is *T. bimaculatus*. Where the latter species occur, it may be necessary to increase the amounts of the chemical mentioned.

Spider mites overwinter on low-growing perennials. These can be destroyed by winter cultivation, giving particular attention to normally uncultivated spots around stumps and along margins of fields. Such practices aid in controlling outbreaks.

• **Tarnished Plant Bug, Rapid Plant Bug, and Related Species**—The tarnished plant bug, *Lygus oblineatus* (Say), the rapid plant bug, *Adelphocoris rapidus* (Say), and related species such as *Creontiades debilis* (Van D.) and *Neurocolpus nubilus* (Say) often cause injury to cotton. The organic insecticides recommended for boll weevil or bollworm control are effective against these plant bugs.

• **Thrips**—Thrips often cause more injury to cotton seedlings than is generally realized, especially in areas where onions, legumes, and small grains are grown extensively. The destruction of leaf tissue by thrips and the subsequent slow plant growth make the seedlings more susceptible to injury by diseases. The injury by thrips alone or the combined injury of thrips and disease may reduce or even destroy stands of young plants. A heavy thrips infestation often retards plant growth and delays fruiting and crop maturity. This delay in crop maturity may increase the cost of harvest and may lower the quality of seed and lint because of the greater damage by insects and deterioration associated with unfavorable weather conditions.

A number of insecticides gave satisfactory thrips control when properly applied. Toxaphene at the rate of 0.5 to 1 pound per acre, in either dust or spray form, gives effective control. A spray mixture consisting of 0.5 pound of toxaphene and 0.25 pound of DDT per acre or a dust or spray mixture of DDT and benzene hexachloride applied at a rate of 0.15 pound of gamma isomer plus 0.25 pound of DDT per acre is also effective.

Heptachlor or aldrin applied to young seedlings as a spray dust at the rate of 0.08 to 0.125 pound per acre gives good thrips control. Dieldrin applied at the rate of 0.05 to 0.1 pound per acre is very effective.

Other insecticides which give satisfactory control either as a spray or a dust at indicated rates per acre are chlordane at 0.5 to 1 pound, benzene hexachloride 0.1 to 0.15 pound of gamma isomer, and DDT 0.25 to 0.5 pound. DDT has not given satisfactory control at temperatures above 90° F.

Although some of the phosphate compounds are effective against thrips, because of their extremely poisonous nature they are not generally recommended for the control of this insect.

• **Tobacco Budworm**—(See Bollworms).

• **White-Fringed Beetles** — The white-fringed beetles, *Graphognathus leucoloma*

(Boh.), *G. peregrinus* (Buch.), and *G. minor* (Buch.), which are pests of cotton and many other farm crops, are known to be present in limited areas of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee.

Larvae of the white-fringed beetles damage cotton by feeding on the roots of young plants. These insects can be controlled by the use of good cultural practices and insecticides. Good cultural practices recommended include the following:

1. Plant oats or other small grains in heavily infested areas.

2. Restrict planting of summer legumes, such as peanuts, soybeans, velvet beans, or other favorable host plants of the adult beetles to not more than one-fourth of the total crop land. Do not plant these crops on the same land more often than once in 3 or 4 years.

3. Do not intercrop corn with peanuts, soybeans, crotalaria, or velvet beans. Prevent the growth of broadleaved weeds, such as cocklebur and sicklepod.

4. Improve poorer soils by turning under winter cover crops.

DDT is effective as a soil insecticide for control of white-fringed beetle larvae. Apply 50-percent DDT at the rate of 20 pounds per acre or 25-percent DDT at the rate of 40 pounds per acre evenly to the soil surface as a dust, spray, or mixed with sand, and then thoroughly mix it into the upper 3 to 4 inches of soil. This treatment will give control of larvae for at least 5 years. DDT may be used in the drill before planting. Use 50-percent DDT at the rate of 5 to 10 pounds per acre, or 25-percent DDT at the rate of 10 to 20 pounds per acre, mixed with sand. This may be applied by hand or by a fertilizer distributor, at or slightly below the depth of seed planting.

Either toxaphene or a benzene hexachloride-DDT mixture applied on cotton foliage gives a residue in the soil, which aids in the control of white-fringed beetles. These insecticides should be used for the control of those cotton insects for which they are recommended in white-fringed beetle infested areas.

• **Wireworms**—Several species of wireworms are associated with cotton. Perhaps the most noticeable damage is caused by the sand wireworm, *Horistonotus uhlerii* Horn., in South Carolina, Louisana, and Arkansas. Adults of the tobacco wireworm (spotted click beetle), *Conoderus vespertinus* (F.), are frequently found on the cotton plant, but the amount of damage to cotton caused by the larvae of this species is not known.

Approved crop rotation practices, increased soil fertility, and added humus help to reduce damage to cotton caused by the sand wireworm. Chlordane, DDT, lindane, and benzene hexachloride have shown promise in the control of this and other species of wireworms on other crops. Additional research on the control of wireworms attacking cotton is needed.

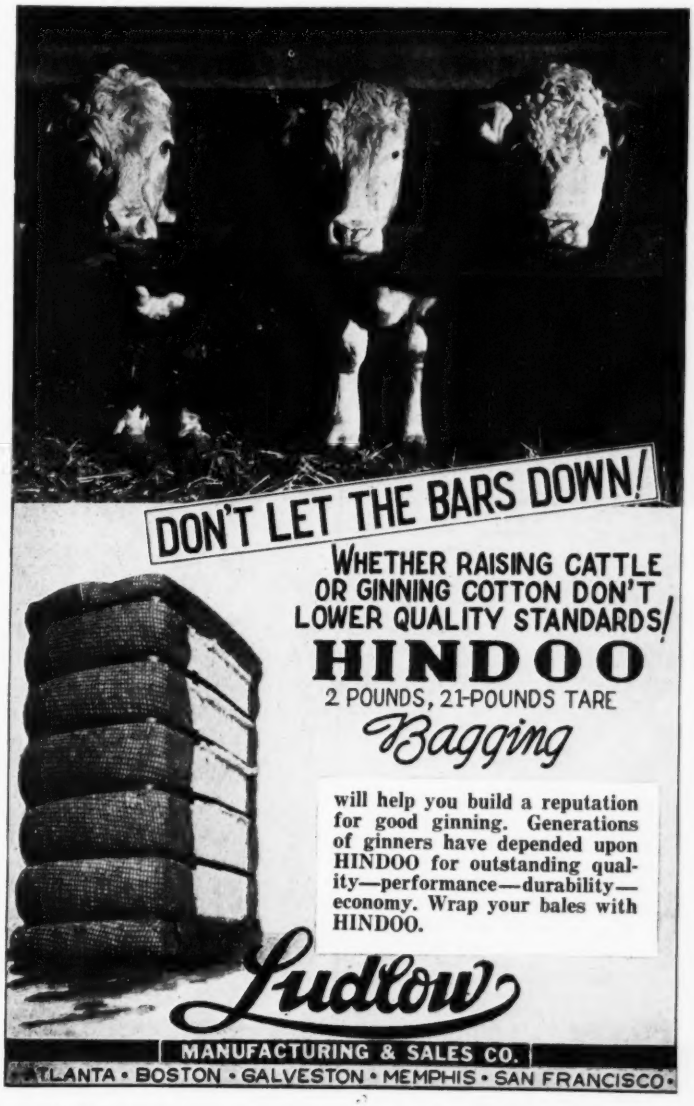
• **Yellow-Striped Armyworm** — For the first time in many years the yellow-striped armyworm, *Prodenia ornithogalli* Guen., occurred in large numbers over a large portion of the Cotton Belt in 1951 and did considerable damage in some locations. It proved to be the most difficult of all the "bollworms" to kill with the organic insecticides. EPN (ethyl-p-nitrophenyl thionobenzenephosphonate) at 0.3 pound per acre applied as an emulsion spray was superior to any of the chlorinated hydrocarbons. However, when used in the early stages of worm development, toxaphene at 2.5 pounds per acre, DDT at 1 pound and dieldrin at 0.3 pound in an emulsion spray give fair control of this insect. Dieldrin in a 3 percent dust and toxaphene in a 20 percent dust applied at the rate of 15 pounds per acre also gave relatively good kills of a mixed population of large and small yellow-striped armyworms.

Miscellaneous Insects

Cabbage looper, *Trichoplusia ni* (Hbn.): The cabbage looper and several other closely related species occasionally caused damage to cotton in localized areas. Dusts containing 5 percent of DDT or 10 percent of toxaphene, applied at the rate of 10 pounds per acre, or sprays containing toxaphene or DDT applied at the rate of 1 pound and 0.5 pound per acre, respectively, are effective.

Corn silk beetle, *Luperodes brunneus* (Crotch): This insect has been reported as a pest of cotton in localized areas in several states but little is known about it.

Cotton root aphids: The species of root aphids known to attack cotton are the corn root aphid, *Anuraphis maidiradicis* (Forbes); *Triphidaphis phaseoli* (Pass.); and *Rhopalosiphum subterraneum* Mason. So far as is known, injury by root aphids to cotton is con-



fined to the Eastern Seaboard. Several species of ants are known to be associated with root aphids, the principal one being the cornfield ant, *Lasius niger alienus americanus* Emery. Chemical conrtol of root aphids has been directed at control of the cornfield ant. Some of the newer materials are known to be effective as soil insecticides, and it is suggested that they be tested against root aphids attacking cotton. Root aphids injure cotton chiefly in the seedling stage. Since cotton in this stage often shows signs of injury without any evidence of insects being present, it is suggested that careful examinations be made of the underground portions to determine the possibility of root aphid attack. Ant mounds at the base of seedling plants indicate the presence of root aphids.

Cotton square borer, *Strymon melinus* (Hbn.): The cotton square borer occurs throughout the Cotton Belt, but rarely causes economic damage. The injury caused by the insect to squares is often attributed to the bollworm.

Cotton stainer, *Dysdercus suturellus* (H.-S.): The cotton stainer occurs within the continental limits of the United States in Florida only. However, probably due to mistaken identity, the literature also records it from Alabama, Georgia, and South Carolina. No work has been formally reported in recent years on control, but observations indicate that dusts containing 10 percent of toxaphene or sufficient benzene hexachloride to give 1 percent of the gamma isomer will control insects of this genus. There are indications that DDT may also be effective in some areas.

Cowpea aphid, *Aphis medicaginis* Koch: The cowpea aphid occurs commonly on very young cotton, especially on the cotyledonous leaves. Cotton is not believed to be a true host of this species and the insect will not complete a life cycle on the cotton seedling.

Darkling beetles: These insects damage young cotton in some areas. They can be controlled with 5-percent chlordane dust applied at the rate of 20 pounds per acre, or with toxaphene, DDT, or a toxaphene-DDT 2 to 1 mixture applied as sprays at the rate of 1 to 2 pounds of technical material per acre.

Flea beetles: These insects are serious pests of cotton in some areas. The same insecticides recommended for thrips control will control flea beetles.

Grape colaspis, *Colaspis flavida* (Say): Calcium arsenate and DDT have given satisfactory control of this insect on cotton.

Salt-marsh caterpillar, *Estigmene acrea* (Drury): The salt-marsh caterpillar can be controlled with toxaphene applied as either a dust or a spray at the rate of 3 pounds of technical material per acre preferably when worms are small.

Insects That Attack Cottonseed in Storage

Cottonseed rarely becomes infested with insects while in storage, if proper precautions are followed. Cottonseed or seed cotton should be stored only in a bin or room that has been thoroughly cleaned of all old cottonseed, grain, hay, or other similar products in which insects that attack stored products are likely to develop. Among the insects that cause damage to stored cottonseed or to cottonseed meal are the cigarette beetle, *Lasioderma serricorne* (F.), the Mediterranean flour moth, *Ephestia kuhniella* Zell., and the Indian-meal moth, *Plodia interpunctella* (Hbn.). Cottonseed that is to be used for planting only may be dusted with toxaphene before being placed in storage. Seed so treated should not be crushed or used for feed.

Parasites and Predators of Cotton Insects

Parasites and predators aid greatly in the control of insect pests of cotton. However, their help cannot always be relied upon and it is usually necessary to use cultural control practices and to spray or dust the cotton with insecticides. Extensive investigations, which have included the importation and colonization in cotton fields of several insect parasites of the pink bollworm, have shown that so far the use of these natural enemies of cotton insects has limitations.

Cotton Insect Surveys

The imoprtance of surveys to an overall cotton insect control program has been clearly demonstrated during the last few years. Cotton insect surveys conducted on a cooperative basis by state and Federal agencies in most of the major cotton-growing states have developed into a broad, currently advisory service for the guidance of he farmer, others associated with cotton production, and the industry that serves the farmers by supplying insecticidal chemicals. As a result of survey work, farmers are forewarned of the insect situation and losses are materially reduced below what they would be without the information thus gained. The survey also helps to direct insecticides to areas where supplies are critically needed.

More people are being employed each year by business firms, individual farm operators, and others interested in cotton production to determine cotton insect populations. It is important that individuals employed by private interests to make surveys understand the control programs as well as how to make infestation counts. Therefore, state and federal entomologists should assist in locating personnel that have at least some basic training in entomology to do survey work for private interests. If this is not done, many growers are sure to be misinformed about recommended control practices.

Information obtained through surveys on insect populations has done much to create interest in cotton insect control programs. When survey data are collected, interpreted, and disseminated at weekly intervals, it is helpful to growers, the insecticide industry, entomologists, and all others interested in an effective control program. The extent and intensity of the coverage largely determine the value of surveys. It is the type of service that can be

In '52: Save the Bolls - Produce the Bales

HE SAVED THE BOLLS, produced the bales . . . and made a profit. Gins and oil mills hum when growers produce a crop like this.

supplied only through leadership and coopreative undertaking. Therefore, it is recommended that cotton insect surveys be continued, that they be placed on a permanent basis, and that they be expanded to include all cotton-producing states.

Wherever possible, it is well to enlist and train voluntary cooperators to make field observations and records and to submit reports during the active season. Wider dissemination of the information that is compiled is highly desirable.

Extension Educational Programs for 1952

There is a serious need for a strong educational program that will present the facts concerning cotton insect control. This program should be conducted in such a way that everyone interested in cotton production will be reached. Growers especially need these facts to help them in making plans for 1952.

In order that cotton growers may follow without confusion the recommendations made by the state and federal entomologists, such recommendations must be basically the same in areas where the insect problems are similar. Points upon which agreement must be reached are: (1) Insecticides that are effective, economical, and safe to use with proper precautions; (2) time to start treatment; (3) rate of application; (4) interval between applications; and (5) how to apply the insecticides. If these points are not agreed upon, the confusion that develops will seriously interfere with effective insect control.

To facilitate the production of a 16,000,000-bale crop of cotton in 1952, the Extension Service will immediately strengthen and intensify its educational work on the seven-step cotton-production program. To help accomplish the goal each state should have the following committees: (1) A state-wide cotton production committee made up of representatives from all agencies and organized groups within the state to help develop, promote, and provide leadership to the program; (2) a technical committee made up of representatives from all state and federal agricultural agencies to prepare recommendations on cotton production and insect control; (3) an extension committee selected by the State Director, which will be responsible for the educational program. Each county or parish should be organized on a basis somewhat comparable to that of the state.

Experience has shown that committees such as those outlined above play an important part in the planning and carrying out of an integrated program in which all agencies and segments of industry can cooperate. As a result of the cooperative effort, growers will be kept informed of the need for insect control and industry will know better the needs for insecticides.

The following steps listed on a seasonal basis outline the extension program that will be carried out in varying degrees in the Cotton states:

Winter

A. State or area meetings with insecticide suppliers and applicators.

B. District meetings with county agents and farm leaders.

C. General county (parish) meetings, stressing early purchase and farm storage of insecticides and equipment.

D. Preparing and issuing radio and newspaper releases, circular letters, and posters on early purchase and farm storage of insecticides and equipment.

E. Securing of cooperation with the farm loan agencies, oil mills, ginners, fertilizer associations, and other groups concerned with the production of cotton.

Spring

A. Surveys by state and federal entomologists to determine boll weevil survival.

B. Continuation of meetings on cotton insect control. Giving of information on the survival of boll weevils and the control recommendations.

C. Newspaper and radio releases on boll weevil survival.

D. Demonstrations on procedure for making boll weevil counts per acre in order to determine when and where early boll weevil control is needed.

E. Counts of boll weevils per acre on seedling cotton.

F. Recommendations on early season control of boll weevils, thrips, and other cotton insects.

G. At least one 4-H Club meeting devoted to cotton insects and their control.

Summer

A. Square infestation counts by state and federal entomologists, county agents, and community workers.

B. Field demonstrations on insect identification, infestation counts, and proper application of insecticides.

C. Timely radio programs, newspaper articles, and circular letters on insect conditions and control.

D. Field tours to study demonstrations and experiments on cotton insect control.

E. Daily radio reports on weather conditions.

Fall

A. Stressing of importance of defoliation in preventing insect damage to young bolls.

B. Promoting an early stalk destruction program to reduce insect populations.

Full use should be made of the following educational tools to stimulate the adoption of recommended practices:

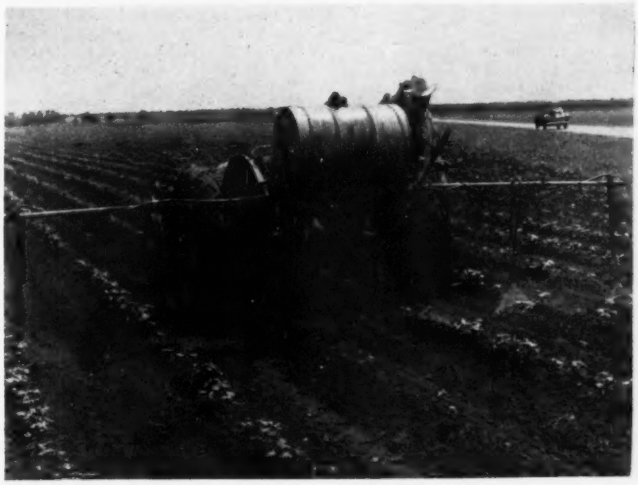
1. Publications — yearly recommendations.
   a. Plan of organizational set-up showing responsibility of each agency.
   b. Yearly recommendations for insect and disease control.
2. Mimeographed informational material.
3. Posters, charts, exhibits at fairs, models.
4. Magazine articles.
5. Cotton letter or other circular letters.
6. Newspaper publicity, special editions.
7. Radio spot announcements and recordings. Sponsored program at set time and day each week so as to build up a listening audience for the program.
8. Public meetings.
9. Individual contacts.
10. Slides and motion pictures.
11. Television where available.
12. Equipment displays at method demonstrations.
13. Result demonstrations.
14. Visits to Experiment Stations.

Needed Research

Additional information is needed on the following subjects:

1. Spray formulations for use in the control of cotton insects.
   a. Solvents and emulsifiers.
   b. Re-evaluation of toxicants and mixtures of toxicants.
2. Designs of machinery and equipment for applying sprays and dusts, in-

In '52: Save the Bolls - Produce the Bales



CUSTOM SPRAYING helps to provide an answer to the small farmer's insect control problem.

cluding aircraft particularly adapted to various agricultural needs.

3. The value of community action in controlling cotton insects.

4. The physiological and phytotoxic reaction of insecticides to plants.

5. The interrelationship between vegetation and fruiting of the cotton plant, with special reference to the timing of insecticide applications.

Basic information is needed on the following subjects:

1. The comparative toxicity of different insecticides and combinations.

2. Defoliation in relation to the control of cotton insects.

3. The effect of early-season infestations on the subsequent development and yield of cotton.

4. The physiological mode of action of insecticides on insects.

5. The effect of sublethal dosages of insecticides upon insect reproduction and development.

6. The effect of temperature, humidity, sunlight, rainfall, and air currents upon the effectiveness of insecticides.

7. Improved techniques for testing insecticides.

8. The effects of insecticides upon natural enemies of cotton insects.

9. The effects of insecticides applied to cotton upon soils and subsequent crops.

10. The effect of insecticides upon livestock, poultry, wild life, and man.

11. The possibility of contamination of food products by organic insecticides applied for the control of cotton insects.

12. The possibility of the development of insect resistance to insecticides.

13. Factors influencing the deterioration of insecticides in storage.

14. The effects of insecticides on honey bees and other pollinating insects.

15. The relation of factors, such as coverage, particle size, distribution, adherence, and residual toxicity of insecticides, to cotton insect control.

16. The effect of ecological factors, cropping systems, natural enemies, cultural practices, and plant nutrition upon cotton insect populations.

17. Combining insect control with other operations in mechanized production of cotton.

18. The seasonal development, life histories and habits of the major cotton pests and others that are potentially injurious.

19. Possible insect vectors of cotton diseases.

Hercules Powder Company Releases New Movie

An ambitious new movie, "Cotton Insects and Their Control," has been released by Hercules Powder Company, Wilmington, Del., manufacturers of technical toxaphene. Designed for the widest use possible in the Cotton Belt, the film contains no mention of toxaphene but emphasizes the point that cotton insect control pays off. The company has made 50 prints of the film available through its branch office representatives or Extension entomologists in the cotton states.

"Cotton Insects and Their Control" is a 16-mm. film in sound and full color. It runs approximately 40 minutes. Most of the movie is devoted to interviews with cotton farmers of the Southwest, Mississippi Valley, the Southeast, and Far West. Bankers, ginners, and other cotton people are also interviewed in a factual, down-to-earth manner.

The movie has been exceptionally well received by audiences at various insect control meetings held early this year, and requests from a large number of state groups are now being filled. In addition to the permanent prints assigned to Extension entomologists and Hercules representatives, a few commercial organizations have purchased prints to show to farmers in their territories. Prints may also be borrowed from Hercules Powder Company, Wilmington, Del.

E.G. McKibben Appointed to Beltsville Research Post

Dr. E. G. McKibben of Auburn, Ala., has been named director of agricultural engineering research in the Bureau of Plant Industry, Soils, and Agricultural Engineering at Beltsville, Md. A leader in his profession for many years and an international authority on tillage mechanics, Dr. McKibben has been in charge of USDA's Tillage Machinery Laboratory at Auburn.

He is a graduate of Iowa State College at Ames in agricultural engineering. Dr. McKibben was head of the Department of Agricultural Engineering of Michigan State College, East Lansing, for a number of years. Later he was in charge of agricultural engineering work for the Pineapple Research Institute at Honolulu before entering USDA. He fills a vacancy left by the death last fall of Arthur W. Turner.

FORREST DRURY, left, manager of the Farmers Cooperative Gin at Olustee, Okla., was among the 175 attending the ginners' field day on Feb. 19 at the Oklahoma Cotton Research Station, Chickasha. He and S. A. Porter, ginning research man, are examining cotton from the station's experimental gin. A report on the ginning research was part of the day's program.

Field Day Speakers Urge GINNERS TO ENCOURAGE Better Production Methods

■ **OKLAHOMA'S Cotton Research Station at Chickasha was site of Second Annual Ginners' Field Day on Feb. 19. Mechanization poses many problems for the ginner, but research is helping him find the answers.**

IT'S JUST good business for the cotton ginner to encourage use of production methods that fit mechanized harvest, particularly stripping.

That was an important point gained by 175 attending the second annual ginners' field day on Feb. 19 at the Oklahoma Cotton Research Station near Chickasha.

Speakers stressed the fact that mechanization is posing many new problems for the ginner. Research is on the way to answers for those problems. Meanwhile, ginners can work closely with farmers on choice of variety, proper planting, and other methods that result in cleaner cotton.

The morning program included reports on research at the station and elsewhere. H. B. Dowell, president of Commander Mills, Sand Springs, Oklahoma's only cotton mill, spoke on "Mill Usage of Mechanized Cotton" immediately after lunch, and the day was concluded with visits to the experimental gins and other buildings and a large array of cotton production machinery.

Highlights of the talks included:

Prof. E. W. Schroeder, Oklahoma A. & M. agricultural engineering department head: "Oklahoma needs increased yield of cotton per acre and lowered cost of production. Proper weed and grass control, and mechanized harvest, offer best opportunities for lowering costs. If cotton makes one-third bale per acre, cost of stripping is $15 to $20 per acre, and can be lowered as yields increase. Hand harvest costs about $40 per acre."

Rex Humphreys, agricultural engineer, Oklahoma Cotton Research Station: "Mechanical harvest requires use of a storm-resistant variety. Fall plow the land for cotton if possible. Spring tillage helps kill weeds. Best spacing for plants in the row, when a stripper harvester is to be used, appears to be 3 to 6 inches on sandy land and 1 to 12 inches on tight land. To get little splatter of seed in the row, use a planter with a narrow throat. Check the planter for rate of drop of seed. The rotary hoe is useful in cultivating cotton. Do not tramp stripped cotton in the trailer."

John M. Green, Oklahoma A. & M. cotton breeder: "Emphasis of the cotton improvement program at the research station is on breeding of early-maturing, high-yielding, storm-resistant varieties. Some selections also are disease-resistant. Stormproof No. 1, Lankart 57, Macha, and Northern Star are good stripper varieties. Stormproof No. 1 had a slight edge in value of lint after ginning, in ginning tests."

Charles Merkel, agricultural engineer, U.S. cotton ginning laboratory, Stoneville, Miss.: "Cotton mechanization is increasing ginners' problems. Ginners are installing lint cleaners, driers, and other machinery. Experience with this equipment so far shows that loss of weight due to removal of trash must be offset by an increase in grade of the cleaned cotton. The mote cleaner of government design can do much of the work of a lint cleaner. The Stoneville laboratory is installing a stick remover in its experimental gin."

James A. Luscombe, agricultural engineer, Oklahoma Cotton Research Station Chickasha: "In tests during 1950 and 1951, on Washita valley cotton an elaborate overhead cleaning system removed more trash, but not enough to substantially increase the grades above those obtained with the moderate setup. Drying temperatures of 200 degrees were most desirable for highest bale values. Lint cleaners raised grades slightly, but when loss of weight was considered, bale value was not increased appreciably and in many instances was decreased. A boll opening device could be considered an essential item of machinery for machine stripped cotton. Machine stripped cotton averaged one or two grades lower than hand snapped cotton and had the added loss due to heavy spot or tinge."

H. B. Dowell, president, Commander Mills, Sand Springs, Okla.: "The housewife who buys cotton goods considers serviceability, cost, appearance. The utmost care is needed to get good quality cotton for manufacture of goods that meet her test. Today, it takes $16,000 investment per worker when a new cotton mill is built. Ginners should not shrink from whatever investment their business requires for production of quality ginned cotton. Up-to-date mechanization from farm through the gin through the mill may be the salvation of cotton as the major textile fiber."

Sonntag Again Heads Texas Co-op Gin Association

More than 400 attended the annual meeting of the Texas Co-operative Ginners' Association at Houston on Feb. 11-12 and participated in one of the best conventions in the organization's history.

G. E. Sonntag, Frisco, was re-elected president and Wilmer Smith, Wilson, was named vice-president, succeeding R. A. Graham, Greenville. Jack Funk, Lyford, is secretary and Mrs. E. M. Cooke, Georgetown, is assistant secertary-treasurer. E. M. Cook was re-elected executive secretary-treasurer of the association.

Directors re-elected are R. T. Frederiksen, Littlefield; J. E. Cox, Waxahachie; and H. E. Gainer, Hutto.

New directors are R. F. Day, Anson; and R. J. Henderson, Kerens.

Hold-over directors are Wilmer Smith, Wilson; Ernest Jones, Lamesa; Jess L. Bell, Rule; C. W. Alverson, Childress; C. E. Sonntag, Frisco; R. A. Graham, Greenville; Glee Taylor, Lake Creek; Oscar Martin, Inez; Milton Hornung, Three Rivers; and Jack Funk, Lyford.

Named members of the association's executive committee were Sonntag, Smith, Funk, Frederiksen, and Cooke.

Storage of Cottonseed

(Continued from Page 69)

selected on the basis of various structural differences associated with their fungicidal activity without regard to their toxic qualities (to humans and animals). Greater importance was attached to the effect of a fungicide on the biological activity (spontaneous heating and the development of free fatty acids) of the seed than to the toxicity of the compound because the primary interest was to establish a principle. Each fungicide was applied at a contentration of 0.1% based on the wet weight of the seed. This is equivalent to 2 lbs. of the active ingredient per ton of seed.

On Spontaneous Heating. Of the 58 compounds examined, 15 were found to inhibit spontaneous heating of artificially moistened cottonseed. Of these, 9 inhibited not only spontaneous heating, but also visible mold growth. The remaining compounds tested neither inhibited nor stimulated spontaneous heating. According to their effects, the fungicides were divided into three classes.

Class I. (A) Inhibition of spontaneous heating and visible mold growth: biphenyl, 8-hydroxyquinoline, Damptox[1] (8-hydroxyquinoline benzoate), Dow 9B[1] (zinc trichlorophenate), trichlorophenyl acetate, Ottasept[1] (p-chlorometaxylenol), 8-quinolinol phosphate, 8-quinolinol sulfate, and naphthalene.

(B) Inhibition of spontaneous heating: Ceresan M[1] (ethyl mercury p-toluene sulfonanilide), Spergon[1] (tetrachloro-p-benzoquinone), Phygon[1] (2, 3-dichloro-1, 4-naphthoquinone), 4K3[1] (1, 3, 5-trimethyl-4-nitrosopyrazole), dehydroacetic acid, and Dactin[1] (1, 3-dichloro-5, 5-dimethyl hydantoin).

Class II. No effect: All other fungicides tested.

The previous investigations of the capacity of chemicals to inhibit biological activity have shown that the majority of those compounds which inhibited spontaneous heating also inhibited the development of free fatty acids. Therefore, many of the fungicides in Class I may be expected to inhibit the formation of free fatty acids. It had not been anticipated that fungicides applied at the low concentration of 2 lb. per ton of seed would exhibit any inhibitory effect on the biological activity of the seed. However, their apparent effectiveness warrants consideration of their application as substitutes for the type of chemical treatments previously investigated. All the compounds in Class I, therefore, are to be tested for their effect on the development of free fatty acids in naturally moist cottonseed stored under controlled conditions of temperature and humidity. Only the fungicides that inhibit the formation of free fatty acids will be selected for further work.

On the Development of Free Fatty Acids, Viability, and Oxidation-Reduction Potentials. From among the fungicides listed in Class I which inhibited spontaneous heating in artificially moistened cottonseed, the following, Ceresan M[1] (ethyl mercury p-toluene sulfonanilide), biphenyl, 8-hydroxyquinoline, and Phygon[1] (2, 3 - dichloro - 1, 4 - naphthoquinone), were chosen to determine their effect on viability, oxidation-reduction potentials, and the formation of free fatty acids in naturally moist cottonseed stored under controlled conditions of temperature and humidity. Simultaneously, the effects of these fungicides were compared with that of the same chemical mixture used in the large-scale storage experiments previously conducted. Talc was used as a diluent and spreading agent for the fungicides and the materials were dusted on the seed. One portion of seed treated with talc only was used as the control. Another portion was treated with 15 lb. per ton of a 10:1 mixture of propylene glycol dipropionate and 1, 3-dimethyl-4, 6-bischloromethyl benzene, the chemical treatment which had given maximum inhibition of deterioration in previous experiments. Each treated lot of seed was subdivided into small samples which were packed in wire mesh baskets and placed in a desiccator. The room was maintained at 78° F., and the moisture content (13%) of the seed was kept constant by forcing air of 80% relative humidity through the desiccators.

The original moisture content of the seed was maintained throughout the storage period of 5 months. The talc-treated control developed free fatty acids at a relatively slow rate starting with an initial free fatty acids content in excess of 4%. Compared with the talc-treated control, the rate of formation of free fatty acids during storage was similar for all samples except those treated with Ceresan M[1] and biphenyl, in which there appeared to be a more rapid rise in free fatty acids content. The fungicidal treatments did not alter the initial viability measurements of the seed. By the twentieth week of storage there was a significant decrease in the germination count of all samples except those treated with Ceresan M[1] in which the initial viability was maintained.

While Ceresan M[1] did not inhibit the formation of free fatty acids, it did maintain viability at its original level for the 5 months storage period. At the concentration used, however, approximately 74% of the seedlings were abnormal. It was indicated by other tests that the abnormality originated from contact of the radical with the mercurial as it protruded through the micropyle during germination The abnormality manifested itself as an exaggerated swelling of the transition area accompanied by a temporary inhibition of growth of the primary root. When placed in a nutrient solution containing calcium and magnesium ions, the abnormal seedlings developed normal hypocotyls and sufficient secondary roots to indicate that the seedlings were of field value provided weather conditions were advantageous.

With the exception of Ceresan M[1] the fungicides tested in this experiment appeared neither harmful nor beneficial to the seed as compared to the talc-treated control. The apparent correlation between viability of the seed and rate of oxidation of seed slurries, as reported for the heat-treated seed, was noted in the comparison of the talc-treated and Ceresan M[1]-treated seed.

It was felt that the interval of 7 months which elapsed between harvest of the seed used in this experiment and the initiation of the experiment may account for the slow rate of deterioration of the untreated seed. This phenomenon has been encountered before; each time the seed had been stored for an extended period at approximately 36° F. (cold storage). Because of this, a new experiment using freshly harvested seed is now in progress.

Significance

Naturally moist cottonseed was heated to temperatures ranging from 100° to 160° F. to determine the effect on germination, red color of the oil, and oxidation-reduction potentials. Preliminary results indicated that germination was destroyed by heating at 160° F. for 10 minutes. Heating at lower temperatures did not destroy germination. A most surprising result was that some heat treatments at 140° F. improved

[1]The use of trade names in this article is for indentification and does not imply endorsement by the Department of Agriculture of this product over similar products not mentioned.

COTTON-GINEERING

From the time builders of cotton ginning machinery first employed anti-friction bearings, they have been depending on SKF Self-Aligning Ball Bearings for top-notch performance with a minimum of maintenance. Pioneered by SKF, these self-aligning ball bearings compensate for shaft misalignment . . . shaft deflection . . . distortion of the foundation . . . and keep friction to the minimum even at high speeds. Whenever your problem is anti-friction bearings, depend on SKF. If it's original equipment, SKF Engineers will help you. If it's replacement, the SKF Distributor organization is available everywhere.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

—manufacturers of **SKF** *and* HESS-BRIGHT *bearings.*

SKF BALL AND ROLLER BEARINGS

IN EVERY INDUSTRY,

SKF Puts The Right Bearing In The Right Place

the germination. This effect was obtained on seed of 20% moisture soon after harvest and on seed of 14% moisture just before planting.

As a result of these preliminary investigations, a greater range of temperatures and types of heat-treatments are being investigated on fresh seed of the 1951 crop. Particular attention is given to repeating the observation that certain types of heat-treatments improve the germination of seed.

This investigation, when completed, will demonstrate the permissible heating conditions which will not affect either the viability or usability of the seed as a source of oil and meal. Such information should be of practical significance in heating seed to control pink bollworm. Every year the area of control is increasing and types of seed which have never been treated before for pink bollworm must be subjected to sterilization. Also, some investigators have been conducting experiments on drying of cottonseed. The range of permissible heating conditions developed in these experiments should be of value to them in their drying program.

There is some indication that special effects may arise from heating. One of these is improvement in germination; another is the possible improvement of storage behavior after heating. Later these improvements may be used in combination with other types of treatments.

A particular chemical treatment comprising use of mixtures containing propylene glycol dipropionate and the isomeric bischloromethyl xylenes, supplemented by forced ventilation, was shown to inhibit heating of seed in commercial bins for 4 months and the development of free fatty acids for 2 months. Although this is still not satisfactory for practical utilization, the results of this experiment indicate that there is some potential for use of chemicals in arriving at a practical storage treatment.

In continuation of this work, 58 fungicides, selected on the basis of the various structural differences associated with their fungicidal activity, were tested for inhibition of spontaneous heating in moist cottonseed when applied at a concentration of 0.1% based on the wet weight of the seed. Fifteen were found to inhibit heating in moist cottonseed. These compounds are now being tested for inhibition of formation of free fatty acids at constant temperature in freshly harvested naturally moist cottonseed. If any of these show particular promise they will be compared to the best treatment thus far used to see whether there is any justification for a larger-scale test of the material. In all of these experiments it is desired to establish a principle as to whether fungicides or other chemicals can be used to preserve seed. No particular attention is being paid to whether these materials are toxic; the theory of the operation being that if it can be established that fungicides have any particular value in preserving seeds, then the problem would be to find a nontoxic fungicide with similar properties.

Acknowledgments

In conducting this research the fellow of the National Cottonseed Products Association gratefully acknowledges the assistance of the Analytical and Physical Division and, particularly, of Walter Pons, for determining the red color in the oils from the heated seed, the assistance of Mrs. M. Z. Condon of the Protein and Carbohydrate Division, for the oxidation-reduction potential determinations, and that of Anthony Baiamonte in some of the germination tests. Thanks are due James B. Dick, agronomist, Delta Branch Experiment Station, Stoneville, Mississippi, for furnishing a portion of the seed used in this work.

Georgia Crushers to Award New Cotton Contest Prize

The Board of Directors of the Georgia Cottonseed Crushers Association has authorized the awarding of a prize to the vocational teacher showing the highest score in chapter participation in the 1952 F.F.A. 1-acre cotton contest. The prize will be the same as those awarded the winning contestants, namely: a free trip to the National F.F.A. Convention in Kansas City, or attendance at some other meeting of equivalent educational value.

The purpose of this prize is to stimulate more interest among the vocational teachers in promoting the contest in their respective chapters. It is felt that it will encourage the participating F.F.A. members to carry through with their cotton project, with their completed records turned in to boost the score of their teacher.

The offer of this additional award has been accepted with enthusiasm by the officials and supervisors of the Department of Vocational Agriculture, the F.F.A. organization and by a committee of teachers which gave study to its feasibility.

New DOBBINS
SPRAYERS and DUSTERS
are TOPS!

New POWER DUSTER

DOBBINS New PTO or engine powered 4, 5 and 6 row COTTON power dusters...

SAVE YOU WORK with dependable, trouble-free, fast-dusting ...large 60-lb. capacity hopper...easily mounted...light weight rugged construction.

SAVE YOU TIME with more efficient dusting action... proven rotary spiral agitator with forced feed.

SAVE YOU MONEY... No wasted dust with positive feed regulation.

DOBBINS POWER DUSTERS GIVE BETTER, MORE EFFICIENT DUSTING AT LOWER COST.

Buy the B... Buy DOBBINS ... 106

SAVE WORK
SAVE TIME
SAVE MONEY!

NEW
SUPER-TRACTION
TWINS

No. 245

NEW DIXIE DUSTER

Completely redesigned, the best all-purpose traction duster you ever owned, improved dust-proof gear box, proven rotary spiral agitator, fully adjustable 2 or 4 rows.

NEW "CENTER BALANCE"

For better traction, easier handling and most efficient dusting.

No. 4040

NEW SUPER-TRACTION SPRAYER with "FRONT WHEEL DRIVE"

Completely redesigned for top sprayer performance, more maneuverable, easier to handle. Heavy duty cam action for steady pumping power, positive pressure 0 to 150 lbs., 25 gal. cap.

WRITE TODAY for illustrated literature

☐ NO. 5106 POWER DUSTER
☐ SUPER-TRACTION DUSTER

DOBBINS MANUFACTURING CO.
Zone 7, Elkhart, Indiana

VARYING DEGREES of bacterial blight (angular leaf spot) damage to cotton are shown here. At left, note damage to unopened bolls. The disease has caused severe damage to the cotton in the open and partially open bolls. Open bolls at right in picture are of good size and the cotton is of good quality. They are from a plant that was only slightly damaged. Leaves in center have been damaged by the disease.

Station Reports on BACTERIAL BLIGHT Damage to Cotton

■ **IN SOME YEARS bacterial blight, or angular leaf spot, causes more damage to the cotton crop in certain areas than drought and excess moisture combined. 1951 was such a year in the Blacklands of Texas.**

By L. S. BIRD

Instructor, Department of Plant Physiology and Pathology, Texas Agricultural Experiment Station, College Station, and cooperative with the Division of Cotton and Other Fiber Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering, USDA.

BACTERIAL BLIGHT (angular leaf spot) occurs wherever cotton is grown. It is a major disease in the Southwestern cotton production areas of the U.S., and is especially severe in the Blackland Prairies and the High Plains of Texas.

The nature of the disease makes it difficult to obtain accurate estimates of yield losses under commercial production. For this reason, a test designed to evaluate losses caused by bacterial blight infection was conducted during 1951 on the Main Station Farm at College Station.

Materials and Methods

The test was a randomized split-plot designed with 12 replications. Four strains were entered. They were: Stoneville 20, a highly resistant strain having only a fair yielding ability; Deltapine, a susceptible commercial variety having high tolerance to the disease; Stoneville 2B, a susceptible commercial variety having medium tolerance; and Acala, a susceptible commercial variety having low tolerance. Stoneville 20 is not a commercial type. It is used as a source of resistance in breeding programs to develop blight-resistant varieties of cotton. Therefore, normally its yield will not compare favorably with the commercial strains used.

The plot length for each strain in a replication was 50 feet. Half of each plot was inoculated (spraying a bacterial suspension through open stomata on the lower side of leaves), with the blight causal organism and the remaining half not inoculated. The two halves were designated blight-infected and blight-free.

The blight-infected plots were inoculated twice. The first inoculation was made at about the fourth true leaf stage and the second during the first part of the flowering period. Bacterial blight is transmitted easily by wind-driven and splashing rain. Therefore, the experiment was designed to decrease as much as possible the natural spread of the disease to the blight-free plots. Yield data and lint percent were obtained for each plot and the data were studied by analysis of variance methods.

Table 1. Average yield per acre for four strains of blight-infected and blight free cotton

Strains	Yield, pounds of seed cotton per acre[1]		Decreased yield due to blight infection[2]	Percent loss due to blight infection	Monetary loss per acre[3]
	Blight-free	Blight-infected			
Stoneville 20 (highly resistant)	213	214	—1		
Stoneville 2B (susc. with tolerance)	266	235	31	11.7	$3.88
Deltapine (susc. with tolerance)	253	216	37	14.6	4.63
Acala (susc. with low tolerance)	180	127	53	29.4	6.63
Average				18.6	$5.05

[1]Average yield for the test was 213 pounds of seed cotton per acre.
[2]The difference in yield between any two strains shown must equal or exceed 16 pounds to give odds of 19 to 1, and 21.4 pounds to give odds of 99 to 1, that such difference is real and not due to chance.
[3]Based on 12.5¢ per pound for seed cotton.

Results

The 1951 growing season was very dry. The average yield was low. No natural blight infection occurred.

As a result of the inoculations, a medium to heavy degree of leaf infection occurred in the infected plots of the susceptible strains. No infection developed in the inoculated plots of Stoneville 20. The infection caused a pronounced amount of leaf shedding in susceptible strains that did not occur in the blight-free plots.

Blight infection caused a highly significant reduction in the yield of seed cotton for the susceptible strains, but the disease had no effect on the lint percent. The yield per acre for the blight-infected and blight-free plots is given in Table I. The amount of loss varied, with the tolerant strains (Stoneville 2B and Deltapine) having less loss than the low-tolerant Acala strain. The reason for Deltapine having a greater loss in yield than Stoneville 2B cannot be explained at this time.

As no boll infection developed in the test, the reductions in yield are attributed to the leaf phase of the disease. The average loss of 18.6 percent in seed cotton yield, or $5.05 monetary loss per acre, for the blight-susceptible strains, as compared with no loss for Stoneville 20, emphasizes the importance of blight-resistant cotton.

Summary

A test designed to evaluate losses in cotton yields caused by bacterial blight infection showed that a highly significant reduction in yield of seed cotton was caused by the disease.

Susceptible strains had an average loss of 18.6 percent caused by the disease, while Stoneville 20, a highly resistant strain, had no loss. The average monetary loss for the susceptible strains was $5.05 per acre.

• Georgia claims to be the first state in the nation to organize a mobile soil testing operation that can go into every community to assist farmers in analyzing soils for lime and fertilizer requirements. Four mobile soil testing units are now in operation in the state.

Mechanical Harvesting Requires Planning

Farmers who intend to harvest their cotton mechanically should plan their operations accordingly throughout the season, the National Cotton Council points out.

Stressing that a number of mechanical harvesting problems stem from failure to plan in advance for the operation, the division explains that row width, terrain, layout, variety of cotton and other factors determined at the beginning of the season, directly affect the efficiency with which the crop is gathered.

Grass and weed infestation and choice of tractors and other equipment also are related to mechanical harvesting.

Most mechanical harvesters are built for 40-inch rows, a width that is becoming standard and one which should be considered if mechanical harvesting is intended for 1952. Many tractors can be adjusted to 38-inch rows and some to 42 or even 36 inches, but proper row width is particularly important in mechanical harvesting especially if a two-row machine is to be used.

Ditches, sharp angle corners, high terraces, steep grades or sharp contour rows are not conducive to efficient operation of harvesting machinery. Similarly, old field trash such as cotton or corn stalks, excessive stubble growth, etc., and fields with stumps, rocks, trees and where old houses have stood, are constant sources of trouble and equipment and repair bills. One rock or piece of brick passing through a picker drum could mean damage to the extent of several hundred dollars and possible permanent impairment of the machine.

Fields that are heavily infested with grass, weeds, sprouts or other foreign growths should not be considered for mechanical harvesting unless such competitive growths can be eliminated.

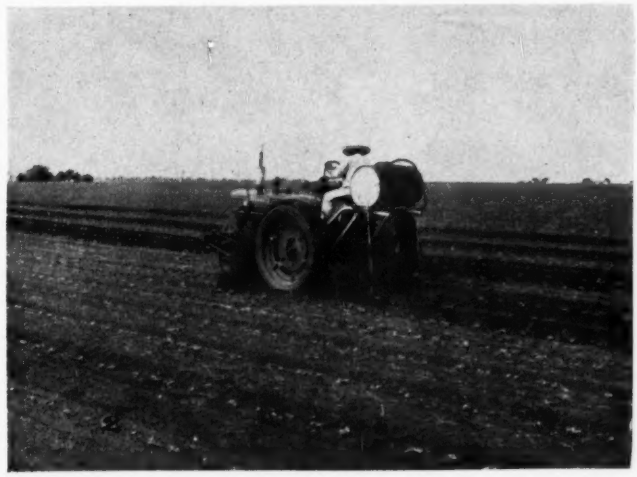
In selecting an adaptable variety of cotton, the farmer should choose a type suited to his particular area and to the kind of harvester he intends to use. Tight locked cottons are best adapted to stripper harvesting. The cotton remains in the boll late in the season, allowing time for all bolls to open and frost to drop the leaves. Much cotton will be lost if stripper harvesting is practiced without concern for variety or timeliness of harvesting.

The spindle-type cotton picker operates most efficiently where bolls are fully open, and cotton is fluffy so that it will be engaged easily in the spindles. The farmer intending to harvest cotton with the spindle-type picker naturally would choose a variety with these desired characteristics.

Noting the rapid trend to mechanical harvesting, the Council points out that farmers making long range plans involving crop rotations, farm layout and field arrangement might consider seriously this evolution. With development of better equipment and techniques, mechanical harvesting eventually is expected to become a general practice.

• Gardening is one of the easiest and cheapest ways of producing some of the most important foods in our diets.

• Terraces should be planted with some crop and not left without some growth.



EARLY-SEASON CONTROL is rapidly becoming a part of the regular farm operation. Here, costs are lowered and efficiency increased by using the rotary hoe, cultivator and spray machine in a single operation.

Miller Is Screw Conveyor's Southeastern Manager

Screw Conveyor Corporation, Hammond, Ind., prominent manufacturers of screw conveyor systems, screw conveyor accessories, as well as bucket elevating equipment, has announced that an office

FRANK A. MILLER

was opened on Feb. 1 at 333 Candler Building, Atlanta, Ga., with Frank A. Miller in charge as Southeastern district manager.

Miller has been identified in the elevating and conveying field for the past 36 years, 11 of which have been spent with Screw Conveyor Corporation in various capacities from plant superintendent to sales engineer. The territory he will serve from Atlanta will include Georgia, as well as Florida, Alabama, Mississippi, Louisiana, Arkansas and the extreme south of Illinois.

Miller's wealth of experience will no doubt be welcomed by customers and dealers in the territory he will cover.

Cotton Research Funds Granted in Texas

A grant-in-aid of $11,000 from the Rio Grande Valley Farm Bureau Federation has been received by the Texas Agricultural Experiment station to further its research work with cotton in the Lower Rio Grande Valley.

According to Dr. R. D. Lewis, experiment station director, $8,500 of the grant will be used in cotton improvement studies and $2,500 to initiate fundamental studies in control of the pink bollworm. Both projects will be conducted at the Weslaco, Texas, substation.

Dr. George Wene will be in charge of the pink bollworm project, and Raymond Cowley, superintendent of the Weslaco substation, will supervise cotton improvement studies.

This is the third year the Rio Grande Valley Farm Bureau Federation has contributed to the cotton research program of the station at Weslaco.

Funds from the organization in the past have been used to conduct trials of standard varieties and promising new strains of cotton under both dryland conditions and irrigation.

THE LONG AUGUST NIGHT WAS HOT—but not as hot as the bitter fighting that raged about Agok, Korea, in the Naktong River area. Sergeant Kouma, serving as tank commander, was covering the withdrawal of infantry units from the front. Discovering that his tank was the only obstacle in the path of an enemy breakthrough, Sergeant Kouma waged a furious

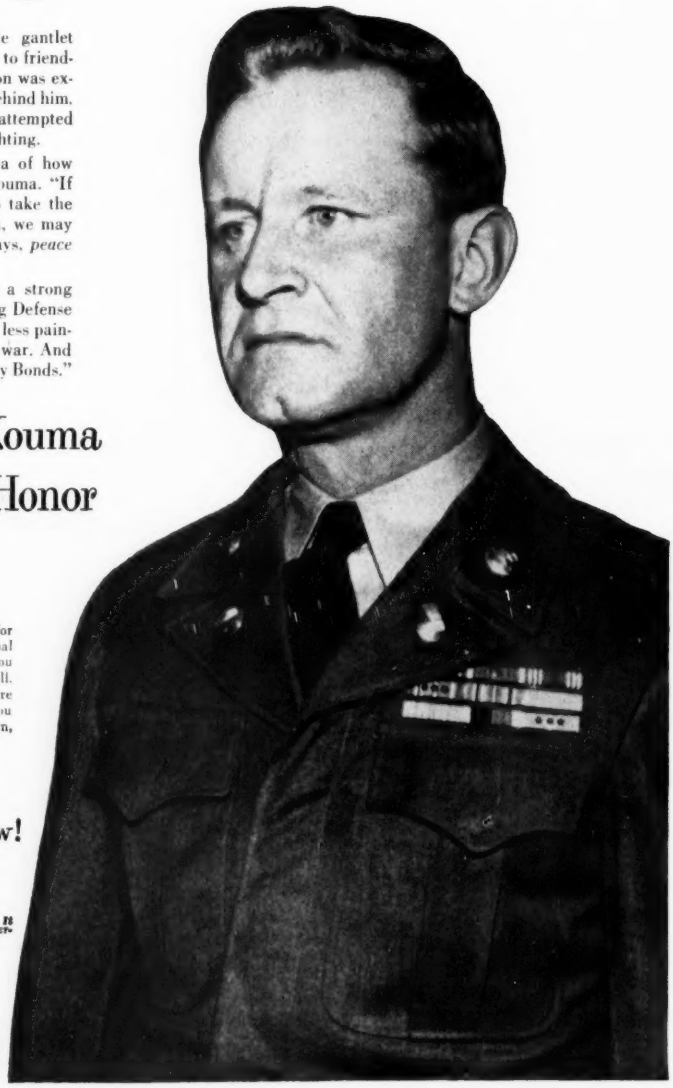
nine-hour battle, running an eight-mile gantlet through enemy lines. He finally withdrew to friendly lines, but not until after his ammunition was exhausted and he had left 250 enemy dead behind him. Even then, although wounded twice, he attempted to resupply his tank and return to the fighting.

"A withdrawing action is not my idea of how Americans should fight," says Ernest Kouma. "If we must fight, let's be strong enough to take the offensive. In fact, *if we're strong enough*, we may not have to fight at all. Because, nowadays, *peace is for the strong.*

"So let's build our strength—to keep a strong America at peace. You can help by buying Defense Bonds—as many as you can afford. It's far less painful to build for peace than to destroy in war. And *peace* is what you're building when you buy Bonds."

M/Sgt. Ernest R. Kouma

Medal of Honor



Remember that when you're buying bonds for national defense, you're also building a personal reserve of cash savings. Remember, too, that if you don't save regularly, you generally don't save at all. So sign up today in the Payroll Savings Plan where you work, or the Bond-A-Month Plan where you bank. For your country's security, and your own, buy United States Defense Bonds now!

Peace is for the strong...
Buy U. S. Defense Bonds now!

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

Soybean Processors Will Meet at Ames, Mar. 4-5

The fourth annual Tri-State Soybean Processors' Conference is being held March 4-5 at Iowa State College at Ames. The conference is sponsored jointly by the agricultural experiment stations of Iowa, Minnesota and Missouri, and the National Soybean Processors Association.

The conference opens with a dinner on the evening of March 4, at which R. G. Houghtlin, president of the National Soybean Processors Association, will be toastmaster. Speaker for the evening will be J. T. Timmons, professor of agricultural economics at Iowa State College. His subject will be "World Population and Food Supply."

The session on March 5 will include a number of talks on subjects of interest to the soybean processors. Among the subjects to be discussed are the following: weed control in soybeans by cultural and chemical practices; effects on soybeans of mechanical and chemical defoliation; variety performance in the tri-state area; soybean diseases in the area; status of studies with soybean meal for nurition of swine. Discussiog these subjects will be Dr. D. W. Staniforth, Dr. E. O. Heady, Dr. C. R. Weber, Dr. W. H. Pierre, and Dr. J. M. Crall, all of Iowa State College; Dr. L. F. Williams of the University of Missouri; and Dr. L. E. Hanson of the University of Minnesota.

The conference will close with a panel discussion of the production capacity for soybeans and soybeans products. Panel chairman will be J. W. Calland of the National Soybean Crop Improvement Council. Others participating will be Maurice O'Reilly of the Iowa PMA committee; Dr. H. B. Cheney and Dr. E. L. Johnson of Iowa State College; and a representative of the soybean processing industry.

Indonesia Forecasts Smaller Copra Exports in 1952

The Republic of Indonesia expects to export approximately 320,000 long tons of copra during 1952. If this forecast is realized, exports would be slightly above the 1950 level of 238,075 tons, but would represent only 70 percent of the postwar high of 455,483 tons shipped during 1951. These totals do not include unrecorded shipments to Malaya which averaged about 90,000 tons per year during 1949 to 1951.

Mississippi Crushers To Meet June 12-13

Announcement was made this week by J. A. Rogers, Jackson, secretary of the Mississippi Cottonseed Crushers Association, that the annual convention of the organization will be held June 12-13 at Hotel Buena Vista, Biloxi, Miss. The convention will be preceded by a barbecue Wednesday evening, June 11. Rogers suggests that hotel reservations be made promptly. Please write Miss Juanita Baltar, convention manager of the Buena Vista.

Byron Kirkland Helps Plan Atlanta Cattle Show

Byron Kirkland, Southeastern field representative of the NCPA Educational Service, is taking an active part in plans for the spring fat cattle show and sale to be held March 11-13 at Atlanta. He is a member of the Chamber of Commerce livestock committee and other committees arranging the livestock show.

During February Kirkland attended a number of agricultural and livestock meetings, including the Florida State Fair, where he visited with many of the state's livestock leaders. The market for cottonseed feed products has grown rapidly in Florida in recent years.

Laurel Duval, New York Produce Exchange, Dies

Laurel Duval, 64, managing director of the New York Produce Exchange, died of a heart attack Feb. 16 at his home in New York City.

Mr. Duval entered the New York Produce Exchange as chief grain inspector in 1922 and in 1938 was elected vice-president of the Exchange. In 1941 he was appointed managing director, as well as being chief grain inspector and chief grain custodian.

Surviving are his wife, Mrs. Mary F. Duval, and a daughter, Mrs. Querida Dunn. A private funeral service was held Feb. 18 in New York City.

Save Money - Buy Direct

GIN BUILDINGS

COTTON HOUSES

Braden sectional steel construction minimizes fire hazards and reduces insurance rates.

Braden representatives will be glad to assist with your building plans and furnish quotations for your Cotton or other Industrial Building requirements.

Call or Write

BRADEN SECTIONAL STEEL BUILDINGS

BRADEN STEEL CORPORATION

1007 East Admiral Boulevard
Phone Long Distance 624—Teletype TU 564
TULSA, OKLAHOMA

DISTRICT SALES OFFICES

Houston, Texas
815 Niels Esperson Bldg.

Donna, Texas
P. O. Box 954

Memphis, Tenn.
309 Falls Building

Dallas, Texas
137 Pittsburgh Street

Shreveport, La.
229 Ricou-Brewster Bldg.

IT TAKES a lot of know-how and hard work to coax 17 bales of cotton out of 5 acres, but that's the record of J. Maurice Smith in the 1951 South Carolina 5-Acre Cotton Contest.

Did It With a Mule, Too

Real-Life King Cotton Gets 17 Bales in 5-Acre Contest

■ **J. MAURICE SMITH of Edgefield, S. C., shattered all past records in the South Atlantic states with a whopping 8,380 pounds of lint in 1951 contest. And as if to prove it was no fluke, he averaged two bales to the acre or better on all but eight acres of the other land he had in cotton.**

WE NOMINATE as a genuine, honest-to-goodness, real-life King Cotton a man who produced 17 bales on five acres last year when even five bales would be considered good.

He's 38-year-old J. Maurice Smith of Edgefield County, S. C., father of four, who began farming a little over a decade ago after eight years in the Navy. His astounding production is an all-time mark for the South Atlantic states. For accomplishing it he got $2,250 in prizes—in addition to the premium price he will get from his high quality staple.

His exact production was 8,380 pounds of lint. This won him first prize of $750 in the South Carolina Five Acre Contest, a type of competition which is now conducted in a number of the Cotton Belt states, but which has been running in South Carolina since 1926 when the Columbia (S. C.) State, morning paper, donated $2,000 in prizes for the first year.

By besting all previous marks Smith won a $1,500 sweepstakes prize put up by the Atlantic Cotton Association. He planted Coker 100 wilt-resistant cotton—the same variety used by 775 of the 789 contestants — obtained direct from the breeders.

Smith uses the best production practices, including crop rotation and contour plowing, and has a completely mechanized farm. However, the five-acre plot he entered in the contest he cultivated by mule. As for his other acreage, he made 91 bales on 48 acres, with all but eight acres making two bales to the acre or better.

The Smiths are a sort of royal cotton family. King Cotton's nearest rival in the 1951 contest was his brother, L. E. Smith, who placed second. In 1950 the Smith brothers' father, E. N. Smith, won the state contest and Maurice was in second place. They all used Coker 100 WR, as have just about all South Carolina state and district prize winners in recent times.

Smith is remodeling his farm home with a large part of his prize money. Next year he will try to better his own record, amazing though it is.

Cotton has been personified as King Cotton for a long time—ever since Senator James H. Hammond of South Carolina declared on the floor of the U.S. Senate in 1856 that "Cotton is King."

But in the South Atlantic states J. Maurice Smith is the real-life "King Cotton" until someone else betters his record and takes the crown away from him.

CALENDAR

Conventions • Meetings • Events

• **March 3-4—Oklahoma Cotton Ginners' Association annual convention. Skirvin Tower Hotel, Oklahoma City, Okla. J. D. Fleming, 1004 Cravens Bldg., Oklahoma City 2, Okla., secretary-treasurer.**

• **March 9-10—Georgia Cotton Ginners' Association annual convention. Henry Grady Hotel, Atlanta, Ga. E. J. Swint, president, Jonesboro, Ga.**

• **March 10-11-12 — Arkansas-Missouri Ginners Association annual convention. Memphis, Tenn. W. Kemper Bruton, Blytheville, Ark., executive vice-president. To be held in connection with Midsouth Gin Exhibit, same dates.**

• **March 10-11-12—Midsouth Gin Exhibit, Memphis, Tenn. For information, write W. Kemper Bruton, executive vice-president, Arkansas-Missouri Ginners Association, Blytheville, Ark.**

• **March 10-11-12 — Tennessee Cotton Ginners' Association annual convention. Memphis, Tenn. W. T. Pigott, Box 226, Milan, secretary-treasurer. To be held in connection with Midsouth Gin Exhibit, same dates.**

• **March 21-22—The Texas Cotton Association annual convention. Hotel Galvez, Galveston, Texas.**

• **March 24-25—Valley Oilseed Processors Association annual convention. Hotel Buena Vista, Biloxi, Miss. C. E. Garner, 1024 Exchange Bldg., Memphis 3, Tenn., secretary.**

• **March 30 — National Cotton Ginners' Association annual meeting. Adolphus Hotel, Dallas, Texas. Carl Trice Williams, P. O. Box 369, Jackson, Tenn., secretary-treasurer.**

• **March 31, April 1-2 — Texas Cotton Ginners' Association annual convention. Fair Park, Dallas, Texas. Jay C. Stilley, 109 North Second Ave., Dallas 1, Texas, executive vice-president. For exhibit space, write R. Haughton, president, Gin Machinery & Supply Association, P. O. Box 444, 3116 Commerce St., Dallas 1, Texas.**

• **April 28-29-30, 1952 — American Oil Chemists' Society spring meeting. Shamrock Hotel, Houston, Texas. William Argue, Anderson, Clayton & Company, Cotton Exchange Bldg., P. O. Box 2538, Houston 1, Texas, general chairman.**

• **May 12-13 — Oklahoma Cottonseed Crushers' Association annual convention. Lake Murray Lodge, Ardmore, Okla. J. D. Fleming, 1004 Cravens Bldg., Oklahoma City 2, Okla., secretary-treasurer.**

• **May 19-20-21 — National Cottonseed Products Association annual convention. Roosevelt Hotel, New Orleans, La. S. M. Harmon, Sterick Bldg., Memphis 3, Tenn., secretary-treasurer.**

• **May 26-27-28 — Fifty-eighth annual convention, National Oil Mill Superintendents Association. Rice Hotel, Houston, Texas. H. E. Wilson, Wharton, Texas, secretary-treasurer.**

• **June 1-2-3—Texas Cottonseed Crushers' Association, fifty-eighth annual convention. Shamrock Hotel, Houston, Texas. Jack Whetstone, 624 Wilson Bldg., Dallas 1, Texas, secretary.**

• **June 2-3—Sixth joint annual convention, Georgia Cottonseed Crushers Asso-**

Leahy Quits Post With Research Committee

John Leahy, who said he plans to enter private business, has resigned as director of the Cotton Research Committee of Texas. Dr. A. W. Melloh, vice-director of the Texas Engineering Experiment Station on the Texas A. & M. College campus, was named acting director of the Cotton Research Committee until a successor to Leahy is selected.

ciation and Alabama-Florida Cottonseed Products Association. The General Oglethorpe Hotel, Wilmington Island, Savannah, Ga. J. E. Moses, 318 Grand Theatre Building, Atlanta 3, Ga., secretary of Georgia association; T. R. Cain, 310 Professional Center Bldg., Montgomery 4, Ala., secretary of Alabama-Florida association.

• June 3-4-5—Tri-States Oil Mill Superintendents' Association annual convention. Hotel Buena Vista, Biloxi, Miss. L. E. Roberts, 998 Kansas, Memphis 5, Tenn., secretary-treasurer.

• June 8-9-10-11—North Carolina Cottonseed Crushers Association-South Carolina Cotton Seed Crushers' Association joint annual convention. The Cavalier, Virginia Beach, Va. Mrs. M. U. Hogue, P. O. Box 747, Raleigh, N. C., secretary-treasurer, North Carolina association; Mrs. Durrett Williams, 609 Palmetto Bldg., Columbia 1, S. C., treasurer, South Carolina association.

• June 12-13 — Mississippi Cottonseed Crushers Association annual convention. Hotel Buena Vista, Biloxi, Miss. J. A. Rogers, Jackson, Miss., secretary.

• October 22-24—Sixth Annual Beltwide Cotton Mechanization Conference. Bakersfield and Fresno, Calif. For information write: National Cotton Council, P. O. Box 18, Memphis 1, Tenn.

Perry Soybean Developed As Superior New Type

Development of a new variety of soybeans to be called Perry has been announced by USDA and cooperating state agricultural experiment stations in Indiana, Illinois, Missouri, and Kansas.

High-yielding and high in oil content, Perry is adapted as a full-season variety in southern Indiana, souther Illinois, central and southern Missouri, and in eastern Kansas, an area south of a line extending east from about Abilene, Kans., through Manhattan, following the Kaw River Valley, and then eastward slightly north of Columbia, Mo., Edgewood, Ill., and Vincennes, Ind.

Seed for general planting of Perry in its adapted area in 1952 is not available. All seed from the 1951 crop is being allotted to experienced certified seed producers for increase so there will be plenty of seed for general planting in the 1953 season.

Perry is the ninth in a series of superior varieties that have come mostly out of the USDA-state coperative soybean breeding program since about the end of World War II. Others adapted in areas from north to south are Monroe, Blackhawk, Hawkeye, Adams, Lincoln, Wabash, Ogden (developed by the Tennessee Agricultural Experiment Station), and Roanoke. These have given most of the nation's producers varieties of soybeans that average 20 percent higher in yield of beans and 10 percent higher in oil content, than varieties previously grown.

A superior variety has been lacking only in the upper south and south-central belt between the adapted producing areas for Wabash and Ogden. Perry will help fill the gap, replacing Wabash, Chief, Patoka, Gibson, and Boone in the northern part of this belt. Breeders now also have under development another variety that is expected to replace S-100 in the southern part of the belt between Wabash and Ogden, thus providing superior varieties for all of the big soybean producing region.

Perry is described by the breeders as an erect-growing, yellow-seeded variety about 3 days later in maturity than Wabash and 9 days earlier than S-100. It has outyielded Wabash consistently in its adapted area and also has exceeded Wabash in oil content and standing ability. In 81 regional tests it averaged 2.7 bushels per acre higher in yield and 3 percent higher in oil content than Wabash.

It also has averaged 3.2 bushels higher in yield and 2.6 percent higher in oil content than S-100. Perry is less susceptible to the disease frog-eye leaf spot than the variety Patoka, but is not as resistant as Wabash. Even under conditions of severe frog-eye leaf spot infection, however, Perry has consistently outyielded Wabash.

Edible Fats and Oils Supplies Set Record

Supplies of edible fats and oils in 1951 were at record high levels. However, the movement of these products into civilian distribution channels was a bit smaller than a year earlier, when inventories in unreported positions were apparently built up.

Civilian disappearance of food fats and oils totaled 43 pounds (fat content) per person, about 2.5 pounds below the 1950 rate, but somewhat higher than in the other postwar years. Disappearance of shortening in 1951 was nearly 2 pounds per person less than a year earlier, butter was down 1 pound and the "other edible oils" were down about ½ pound, but both lard and margarine increased approximately ½ pound. Despite this reduction in the marketings by major distributors in 1951, however, civilians probably consumed about as much edible fats and oils per person as year earlier by drawing upon inventories of wholesalers and retailers whose stocks are not reported.

Exports of food fats and oils, including the oil equavilent of oilseeds, from this country in 1951 were record in size, about 25 percent above the previous year's total of 1,050 million pounds.

Production of food fats and oils in 1951 was about 5 percent above a year earlier, setting a new record. A large increase in vegetable oils and lard more than offset a sharp drop in butter. The large crops of oilseeds in both 1950 and 1951 plus the increase in the number of hogs slaughtered in these years maintained production of food fats and oils at a high level. Production of margarine was up 11 percent, while shortening output declined 18 percent.

Reported stocks of food fats and oils at the end of 1951 totaled 1,036 million pounds, 25 percent above the low stocks of a year earlier and the largest for that date since 1946.

Total supplies of food fats and oils this year are expected to be sufficiently large to maintain civilian consumption and both military and export takings at a high rate. Civilian disapperanance per capita for these products in 1952 probably will be larger than a year earlier, with increases in shortening, margarine, and perhaps lard and "other edible oils" more than offsetting the prospective decline in butter. Retail prices of edible fats and oils, except for butter, are expected to average lower than in 1951. Current prices for most of these products are substantially below their OPS ceilings.

Production of edible fats and oils (including the oil equivalent of exports of peanuts and soybeans) in the marketing year October 1951-September 1952 probably will total about 9.2 billion pounds, 0.3 billion pounds greater than the record volume reached a year earlier. Increases in the output of cottonseed oil and lard are likely to more than compensate for the anticipated decline in butter and soybean oil.

Exports of edible fats and oils (including the oil equivalent of oilseeds) probably will be large again even though they may not reach the record 1951 total.

• In a three year rotation at the Southern Piedmont Conservation Experiment Station, Watkinsville, Ga., cotton yields increased from 737 pounds seed cotton per acre to 1,116 pounds per acre. The land in rotation lost much less soil per acre from erosion.

• Farm terraces should be finished so that the sides slope gently to the top.

BARCO

All Formulations
and
All Combinations of
Cotton Poisons

DDT	Aldrin
BHC	Dieldrin
Toxaphene	Parathion
Chlordane	Tepp
Heptachlor	Lindane

BARCO CHEMICALS, Inc.
67 Butner Street
DES MOINES 15, IOWA

As Viewed from

The "PRESS" Box

• This Issue and Insect Control

IF THIS Fifth Annual Cotton Insect Control Issue proves anything, it is this: no single cotton production practice has met with more enthusiastic response from the cotton farmer than insect control.

We decided five years ago, when the control movement really began to get up steam, that it would be a good thing for cotton if somebody gave the industry a single package containing the current best thinking on the subject, the recommendations of the major producing states, and other material relating to insect control.

It has turned out to be a good idea, as this issue shows, but we never dreamed that five years later we would be able to give you an issue 144 pages big. It establishes a new record for us so far as size is concerned.

But size means little if quality is not present. And it is because of their quality that we take special pride in the feature articles you will find here. We are not going to suggest that you consume the entire issue in one sitting, but we do feel you will find it worth the time eventually to read every line of material in this issue relating to the control of insects. When that is done we believe ginners and crushers will know better how to work with farmers in making the control program more efficient and profitable.

The colored insert in the center of the issue, showing the major beneficial cotton insects, is something new and important. It will help you to identify these friendly bugs and better understand their role in controlling the harmful insects. Not enough is known about beneficial insects, but at least we are beginning to appreciate their values. Incidentally, the same pictures are appearing this month in The Progressive Farmer and ACCO Press. The three publications cooperated in making the plates, preparing the story that goes with them, and getting the information out to a great many people throughout the Belt who can make good use of it.

Chances are you have already become familiar with the theme of this issue: In '52: Save the **Bolls**—Produce the **Bales**. We think there is no better, or more profitable, way to save cotton bolls than by controlling cotton insects.

• A Little Good, Anyway

MINOR CHANGE in the regulation under which cottonseed oil products are purchased from crushers as part of the price support program, announced recently by USDA, apparently will affect only one company on the West Coast. Under the new rule, CCC will treat two or more mills as a single contracting unit when they are under the same management and are located in such proximity that they have indentical freight rates. The single company in question operates two mills in the same city. The CCC transportation office says that if mills owned by the same company are more than six miles apart freight rates will be different.

• Tax Amortization Regulations

CHANGES IN Defense Production Administration's regulations governing rapid tax amortizations will be of interest to ginners and crushers. The new rules, effective March 1, require that on all construction costing more than $100,000 the certificates of necessity be issued before construction is started. A number of certificates have been approved for cotton gins, especially in West Texas and California, but the only applications approved for compresses or warehouses were three of the first applications filed by California operators.

• New Record for Margarine

THE PRODUCTION of margarine set a new record in 1951, the output of all types amounting to more than 1 billion pounds. This is particularly significant inasmuch as 1951 was the first full year in which the industry operated without the Federal excise tax on colored margarine. In 1949, the last full year of the tax, production was about 900 million pounds. As predicted by legislative proponents of the tax repeal, colored margarine production has increased sharply, 850 million pounds last year as compared with 177 million pounds in 1949. The last remaining Federal prohibition against margarine probably will be removed soon. The House Armed Services Committee has apporved a bill allowing the Navy to serve margarine as a table spread and the Senate committee is scheduled to take up this bill soon.

• Midsouth Gin Exhibit

SOMETHING NEW is being added this month. It's the first annual Midsouth Gin Exhibit to be held at Memphis March 10-11-12. At the same time, and at the same place, the Arkansas-Missouri and the Tennessee ginners' associations will hold their annual conventions.

W. Kemper Bruton, Blytheville, Ark., has been the big gun behind the Exhibit. It takes a lot of planning and hard work to put over something that big, and it's double the work when you're doing it for the first time. But, Bruton says, the big show is already an assured success.

The Midsouth Gin Exhibit is going to prove a good thing for ginners, the ginning industry, and the many exhibitors who will show their wares there.

• If new ground must be burned, the fire should be kept under complete control at all times to prevent it from reaching the wooded areas.

• One kilowatt-hour of electricity will milk 20 cows, heat 4 gallons of water, grind 100 pounds of grain, run a tool grinder for 3 hours, or cool 10 gallons of milk.

Judge Carr to Speak at NCPA's Annual Meet

Judge Robert Bryan Carr, presiding judge of the Court of Appeals of Alabama, will be one of the outstanding speakers on the program of the fifty-sixth annual convention of the National Cottonseed Products Association, May 19-21, at the Roosevelt Hotel in New Orleans.

Judge Carr has a wide reputation as a speaker who combines wit and humor with a sound, American philosophy of life. Members of the cottonseed crushing industry who have heard him feel that his talk will be one of the most enjoyable and instructive features of the National Convention.

A native of Choctaw County, Alabama, Judge Carr graduated from Southern University and received his law degree from the law department of the University of Alabama.

He began the practice of his profession in Anniston, was the U.S. Commissioner from 1918 to 1920, and was elected presiding judge of the Seventh Judicial Circuit in 1924. He served in this position until 1944, when he was appointed to the Court of Appeals of Alabama.

Elected to a six year term in 1946, he became presiding judge of the Court of Appeals in 1951. He is a Democrat, a Methodist and a member of the Kiwanis Club.

USDA Gives 1951 Report On Soybean Movements

No bulk cargos of soybeans originating from China or Manchuria transited the Suez Canal during November-December 1951, according to the latest report to USDA from Port Said. Total (revised) northbound bulk soybean shipments through this waterway during 1951 were 524,063 short tons, or 17,468,770 bushels. In addition, a bulk cargo of 7,535 tons of soybean oil (equivalent to 50,235 tons or 1,674,500 bushels of beans) passed through the Canal during February 1951. Thus, on a combined basis these bulk shipments accounted for 574,298 tons or 19,143,270 bushels of soybean equivalent.

In all, 52 cargos of soybeans passed through the canal during 1951. Of these, 43 originated from the South Manchurian port of Dairen, and the other shipments originated from the ports of Chinwagtao, Vladivostok, Chefoo, and Bahrein.

Turkey's Cotton Crop Estimated as Record

Estimates of the 1951-52 cotton crop in Turkey, made by various government agencies, range from 620,000 to 780,000 bales of 500 pounds according to reports to USDA. Although there is a wide difference of opinion among sources in Turkey regarding the size of the crop, it appears that all estimates are considerably above the previous record crop of 562,000 bales reported in 1950-51. A joint committee representing several interested agencies was sent by the federal government in January to the major producing regions to determine a more accurate estimate of the crop.

India Announces Export Quotas for Linseed Oil

India's export quotas for linseed oil for the period January-June 1952 have been announced, according to reports to USDA. The trade notice provided that:

(1) Established exporters of linseed oil will be given quotas at 25 percent of the exports of linseed oil effected by individual shippers during the basic year chosen by them;

(2) Established exporters of linseed will also be given quotas at 25 percent of their basic year exports of linseed converted in terms of oil (for conversion the formula that will be adopted is 3 tons of seed is equal to 1 ton of oil.)

Production of flaxseed in India has decreased from the prewar average of 18,096,000 bushels. The 1950-51 output of flaxseed was estimated at 15,400,000 bushels, a decrease of more than one million from the previous year. Unofficial forecasts indicate that flaxseed production in 1951-52 is not likely to exceed 15,000,000 bushels.

Farmers Advised to Buy Fertilizer Supplies

Buy fertilizer as soon as possible, or enough may not be available when needed, Mississippi farmers have been advised by Dr. Clay Lyle, director, Mississippi Agricultural Extension Service, State College, Miss.

"Fertilizer warehouses are filled to capacity, and production is being curtailed because of lack of storage facilities," he pointed out. "This will become increasingly serious unless shipments be-bin moving to farms immediately."

"The already short supply for this year may be further decreased because of transportation difficulties."

A farmer who does not buy fertilizer until he is ready to use it may not be able to find all he needs this year. A dry place suitable for storing fertilizer can be provided on many farms.

"Greatly increased food and feed production is badly needed in Mississippi and the nation in 1952, but heavy fertilizer applications are necessary for this production," Dr. Lyle stated.

Fertilizer can be a "labor saver" by making possible higher yields per acre, with production of each crop only on the acres best suited to it, he said. Efficiency of this kind is especially important with the increased costs of farm production expected this year.

County agents have specific fertilizer recommendations for cotton, corn, pastures and other crops. They also will assist with soil testing, which is a guide to more economical use of fertilizer in programs for high yields.

Brazil Reports Favorable Prospects for Oilseeds

Brazil's 1952 oilseed prospects appear favorable and production may exceed the small 1951 harvest, according to the latest information available to the Office of Foreign Agricultural Relations.

The planting of cottonseed, peanuts, soybeans, and castor beans in South Brazil was delayed for more than a month because of the late arrival of the rainy season but was completed in early December and good crops, with the possible exception of peanuts, still may be obtained. Plantings in North Brazil got underway when the rainy season began the first part of the year, and with continued normal conditions abundant crops can be expected.

The 1951 oilseed crops were on the whole the smallest in recent years, due largely to the drought and insect damage to cotton in North Brazil which was only partially offset by the favorable oilseed crops of South Brazil. The cottonseed harvest is estimated unofficially at 639,300 tons, or about 9 percent less than the previous year. It is too early to forecast the 1952 harvest as plantings were just completed in mid-January in South Brazil and normally do not start until March in North Brazil. Under normal weather conditions a crop of 770,000 tons or better could be expected.

Shortages of cottonseed oil and cake were reported in North Brazil due to the short crop. Oil shipments from Brazil totaled 9,428 tons during January-September 1951 with 5,659 tons consigned to the United Kingdom.

Peanut production in 1951 is estimated at 163,000 tons or 25 percent larger than in 1950. Late fall planting of the 1951-52 "wet" season crop in Sao Paulo, because of the delay of the rainy season, undoubtedly will reduce the 1952 harvest. Moreover, lower peanut prices than in the previous year likely had an important bearing on the acreage planted.

At Beef Cattle Feeding Demonstration on Feb. 14

PICTURED at a beef cattle feeding demonstration on the J. E. Meador farm near Helena, Ark., on Feb. 14 are, left to right, Dalton E. Gandy of the NCPA Educational Service; Joe C. Brady, manager of the Helena Cotton Oil Company; Ray E. Drenner, head livestock buyer for Wilson & Company, Memphis; and G. B. Thorne, vice-president of Swift & Company, Chicago. The demonstration was sponsored by the Arkansas Extension Service, J. E. Meador, and Wilson & Company. Brady supplied copies of the 1952 Feeding Practices bulletin, which were distributed to livestock producers in attendance.

Ceylon Revises Export Duty For Coconut Products

A new sliding scale of export duties on copra, coconut oil, desiccated coconut, and fresh coconuts was announced by the Ceylon government and became effective Dec. 10, 1951, according to reports to USDA.

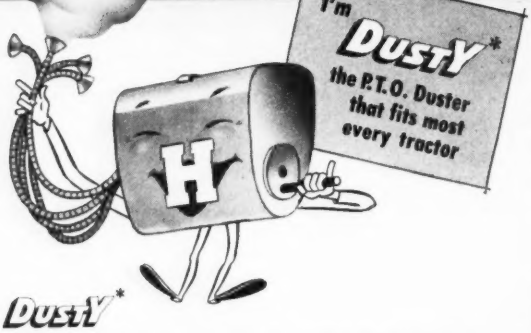
The duty on coconut oil, desiccated coconut, and fresh coconuts is calculated on a percentage basis of the amount of duty on a ton of copra. This rate was amended for coconut oil and desiccated coconut effective Dec. 24, 1951. On coconut oil the export duty per ton is at a rate equivalent to 80 percent of the duty on a ton of copra (revised downward from 90 percent established on Dec. 10.) The duty on desiccated coconut is placed at 60 percent of the duty levied on a ton of copra (also adjusted downward from 70 percent). The duty on fresh coconuts is 25 percent of that levied on a ton of copra.

Cotton and Linter Exports

Exports of cotton from the U.S. in December totaled 974,000 running bales, making 2,863,000 bales for August-December, 1951. The December total included 176,000 bales to India, 152,000 to Japan, 113,000 to the United Kingdom, 82,000 to Belgium, 76,000 to France, 72,000 to Italy, 56,000 to Western Germany, 42,000 to the Netherlands, 42,000 to Canada, and 38,000 to Spain.

U.S. exports of cotton linters in December amounted to 28,000 running bales, making a total of 72,000 bales for August-December.

When you dust... DEMAND HUDSON DUSTERS for Positive Insect Control



The difference between profit and loss is often determined by the thoroughness of insect control. Whether you have a patch or a farm, there is a Hudson duster that will save work and help increase yields. In the Hudson line there are tractor power take-off dusters, mule or horse drawn traction dusters, hand operated rotary dusters and also knapsack and plunger dusters.

DUSTY*

. . . AN ENTIRELY NEW IDEA IN P.T.O. DUSTERS

Hudson Dusty is different—different in 3 ways that will save you time and work and do a better job.

1. Non-clogging, heart-shaped hopper holds 85 lbs. of average density dust.

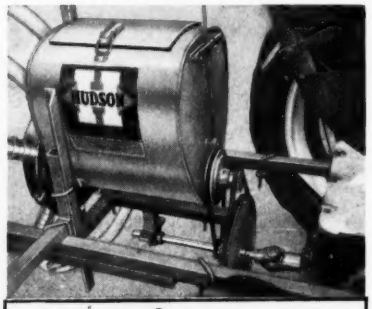
2. Low speed spiral agitator keeps dust thoroughly mixed.

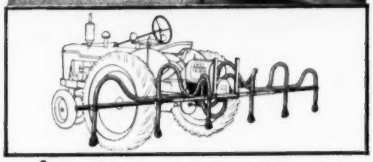
3. Five-blade, 14 inch fan blasts a huge volume of air-dust mixture at tremendous velocity.

OTHER FEATURES: Positive, easy-set dust volume selector . . . can be pre-set for desired discharge rate . . . lever can be moved to "off" position and then returned instantly to resume former rate.

Universal joint connection to power take-off shaft for easy mounting to almost any tractor with one of four mounting kits.

All metal hinged boom with flexible metal dust hose and metal nozzles. **Guard** for shaft, pulleys, belt at low cost.

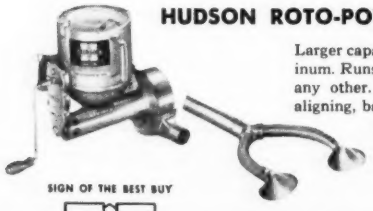




NEW HUDSON ROTO-POWER* Duster "801"

At its favorable price, this is the lightest running, most durable duster. Hopper agitator, plus beater, moves dust into high velocity fan, onto plants mixed as it was in package. Discharges 5 to 30 lbs. per acre. Holds 8 lbs. average density dust.

HUDSON ROTO-POWER* Duster "806"

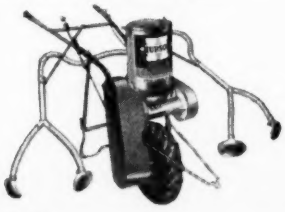


Larger capacity, lighter weight, all aluminum. Runs lighter, higher powered than any other. The only duster with self-aligning, ball and Oilite bearings in the ideal combination. Discharges 5 to 45 lbs. per acre. Holds 15 lbs. average density dust.

SIGN OF THE BEST BUY

HUDSON PORTA-DUSTER*

Light running traction duster applies 5 to 45 lbs. of dust per acre, two or four rows at once. Holds 23 lbs. average density dust. Easy nozzle adjustment. Thumb "throttle" discharge control. Dust-proof Timken wheel bearings. Belt drive with remote control clutch.



*TRADE MARK

HUDSON

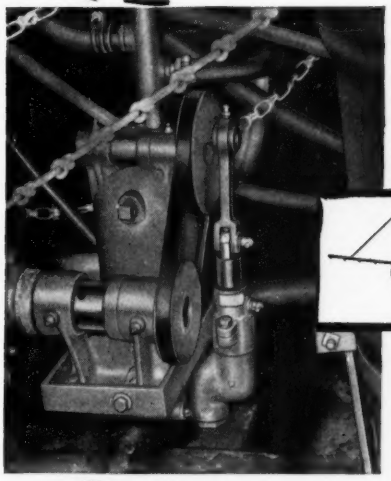
H. D. HUDSON MANUFACTURING COMPANY

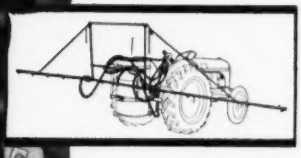
589 East Illinois Street • Chicago 11, Illinois

FREE: Catalog showing complete line of Hudson Sprayers and Dusters available on request. Write today.

When you spray... DEMAND HUDSON SPRAYERS for Positive Insect Control

The difference between profit and loss is often determined by the thoroughness of insect control. Whether you have a patch or a farm, there is a dependable Hudson sprayer that will save work and help increase yields. In the Hudson line there are tractor power take-off sprayers, engine-powered sprayers and a variety of hand operated sprayers to meet every need.





PETEY*... The first really practical P. T. O. Sprayer. The piston pump is, beyond doubt, the most satisfactory for power spraying. Now Hudson makes it available for P. T. O. use with these important benefits: (1) Vastly greater life with minimum service as compared to P. T. O. pumps of gear, impeller, or rotary type; (2) No gears to wear, no rubber to age; (3) No drop-off in output or pressure throughout long life. PeTeY Sprayers fit most all U.S. tractors with P.T.O. speeds of 600 R. P. M. or less. See PeTeY at your Hudson dealer.

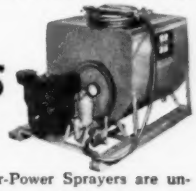
New HUDSON RO-KROP*

A real time and labor saver, designed especially for cotton spraying. Spray up to an acre with one normal tank loading of 1½ gallons. Adjustable outer nozzles to get most complete coverage at various stages of growth. Tank is famous Hudson Simplex* Innerseal* design. Write for full information now.

SIGN OF THE BEST BUY

PEERLESS* POWER SPRAYERS

FOR ALL FARM PURPOSES
4 or 8 gallons per minute



Self-powered, Hudson Peerless Super-Power Sprayers are unequalled for low cost and long satisfactory service for all types of insect and weed control, including livestock spraying and whitewashing. Mounted on skids, as shown above, for hauling on Hudson Adapto* trailer or on truck . . . or on pneumatic tires as shown below. 400, 500 or 800 lbs. pressure; 4 or 8 g.p.m. pump capacity, 50, 100 or 150 gallon welded steel tanks. Positive mechanical agitation on all models.

HUDSON "NO-WHIP" MULTI-BOOM

Designed especially for use with all Hudson Power Sprayers. Rugged. Rigid. Non-corroding brass nozzles and tubing protected in steel sheath for long life.

*TRADE MARK

HUDSON

H. D. HUDSON MANUFACTURING COMPANY
589 East Illinois Street • Chicago 11 Illinois

FREE. Catalog showing complete line of Hudson Sprayers and Dusters available on request. Write today.

Classified Advertising

RATES: Ten cents per word, per insertion. Include your firm name and address in count. Minimum advertisement $2.00. Strictly cash basis—enclose check with order. Write copy plainly.

Oil Mill Equipment for Sale

FOR SALE—One French 4-cage screw press with 5-high 72" cooker, hypoid drive. One double box, all-steel Continental up-packing linter press and EJ tramper. One set 60" French 5-high crushing rolls, two bottom rolls roller-bearing, bottom roll 18", four top 16". Rolls have been reground and top roll corrugated.—Sproles & Cook Machinery Co., 151 Howell St., Dallas, Texas. PRospect 5958.

OIL MILL EQUIPMENT FOR SALE—Anderson Expellers, French screw presses, cookers, dryers, rolls.—Pittock and Associates, Glen Riddle, Pa.

FOR SALE—Two brand new Fort Worth brushless linter attachments. $150.00 each, f.o.b. Wilson, N. C.—Farmers Cotton Oil Company, Wilson, N. C.

OIL MILL MACHINERY FOR SALE: Cookers — Pumps — Presses — Cylinders — Heads — Columns — Formers — Accumulators — Hydraulic Pumps — Hot Cake Cutters and Strippers — Filter Presses, 32x32 with 49 Plates — Electric Motors, 15 to 150 h.p. with starters — Shaft Coupling and Pulleys — 30" Chandler Huller — Post and Pillow Block Ball Bearings — Conveyor Heads and Hangers — Enclosed Right Angle Drives — Sprockets — Carver Lint Tailing Beater. —Write, wire or phone Sproles & Cook Machinery Co., Inc., 151 Howell Street, Dallas, Texas. Telephone PRospect 5958.

FOR SALE—72-85" cookers, rolls, formers, cake presses and parts, accumulators-pumps, hull-packers, Bauer No. 153 separating units, bar and disc hullers, beaters-shakers, Carver linters, single box baling presses, filter presses, expellers, attrition mills, pellet machines, pneumatic seed unloader. If it's used in oil mill, we have it.—V. A. Lessor and Co., P. O. Box No. 108, Fort Worth, Texas.

FOR SALE—Two V. D. Anderson tubular dryers, cheap. Also, one 34" filter press, recessed type.—California Extraction Co., P. O. Box 187, Norwalk, Calif.

MACHINERY FOR SALE—1 Attrition mill, new; still on shipping skids, Sprout Waldron Monarch 36", complete with 2 60 h.p. 1175 r.p.m. G.E. motors; winding to suit, auto starters. 1 Attrition mill, used; Sprout Waldron type 30 with 2 30 h.p. 1700 r.p.m. motors; winding to suit, and Stearns magnetic separator. 1 seed cleaner, used; Huntley Monitor No. 2C. Priced for quick sale by owners to settle estate. Write Box "EF", c/o The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas 1, Texas.

Gin Equipment for Sale

FOR SALE—4-80 saw Murray gin stands, modern glass fronts, new saws and ribs. Four Super Mitchells for above, all in good condition, ready to gin cotton.—Farmers Union Coop Gin, Hinton, Okla.

MURRAY GINS FOR SALE—5-80 saw Murray steel, late model, loose roll, glass fronts, air blast gins. Very reasonable price. Gins operated past season. Will be replaced by 99-saw gins.—R. B. Strickland & Co., 13-A Hackberry St., Tel. 2-8141, Waco, Texas.

FOR SALE—By owner, 4 large L.E.F. extractor cleaners, three years old, handled 4,000 bales, as good as new. Real bargain.—W. T. Akin, Route 1, Michigan City, Miss.

FOR SALE—One Continental wood steel band press. Bottom and top steel sills. All-steel Cameron packer, ram and casing good condition. $1,000.00 f.o.b., Madill, Oklahoma. Write or call Muskogee Cotton Oil Mill, Muskogee, Okla., P. O. Box 1567, Telephone 8118.

FOR SALE—One complete Murray steel bound press with hydraulic cylinder and ram assembly, with Murray double chain tramper belt driven. Five 80-saw direct coupled with new fronts. Also, one Murray 3-drum quad cleaner. Can be seen at any time.—A. J. Wendel Gin, El Campo, Texas.

FOR SALE—4-80 Lummus air blast gin. Complete, good condition, just finished 1951 crop. Has thermo cleaner, dryer, boiler, LEF feeders, electric power. To be moved off premises.—I. W. Briscoe, Greenville, Texas.

FOR SALE—One 14' Hardwicke-Etter wooden frame burr extractor, latest type screens, $1,200.00 f.o.b. Leland Miss.—T. J. Hays, Hollandale, Miss.

A COTTON GIN FOR SALE—Machinery consists of 5-70 Continental and double bur extraction, air line cleaner and 1 type cleaners, all necessary equipment, 34 ft. truck scales, new, 25,000 capacity, two warehouses, cotton house and a good large seed house. Electric power, 5 acres of land. Write Box "GB" in care of The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

FOR SALE—Murray big reel drier, good condition, price $1,000.00. Six drum cleaner, $500.00. Fairbanks-Morse, 75 h.p. engine, $2,000.00.—R. B. & J. H. Williams, R.F.D. 1, Box 25, Natchitoches, La.

SPECIAL VALUES—We list below a few of many good items we have in stock and available: Extracting Feeders: Four 66", 80-saw, F.E.C. Mitchell ball bearing, pressed steel, "double decked" flat belt complete with supports. Four 1941 model 66" Mitchell super units. Four 80-saw 66", 1941 model Hardwicke-Etter V-belt driven, A-1 condition. Five 70-saw Hardwicke-Etter steel ball bearing feeders with bur conveyors under them. Five 80-saw Murray Bleweths. Four 70-saw Murray Bleweths. Three 66" Continental "Double X." Five 80-saw Murray 6" mote conveyor steel ball bearing, direct connected gins. Five 70-saw Murray "glass front" ball bearing, direct connected gins, new saws two years ago. One Murray "PH" and one Murray "PX" steel bound presses, with or without hydraulic rams and casings and trampers. One Union and one Murray horizontal triplex belted hydraulic pumps. One Murray "VS" 52" steel separator. One 50" Continental steel screen drum separator. Used and reconditioned fans and transmission equipment. New Phelps fans for any purpose. "Dependable service is our slogan."—R. B. Strickland & Co., 13-A Hackberry St., Tel. 2-8141, Waco, Texas.

FOR SALE—5-70 saw Lummus automatic gin complete with large Murray bur machine and three cylinder after cleaner, new all-steel condenser and lint flues, electric power. Reasonably priced. Ginned very little cotton, a good gin to be moved. All ball bearings. Address, Gin, P. O. Box 216, Brookshire, Texas. Phone 81.

FOR SALE—5-80 Cen-Tennial, all steel unit including prefabricated steel building. Should gin 3,000 or better this year. Sacrifice at $32,500 with $15,000 cash. 4-80 Continental ginned 4,800 in 1951. Will do better this year. Late model 5-80 Murray complete, except building and scale. Must be moved. A real bargain at $27,000. 4-90 Murray should gin capacity. Must sell because of health. Price $65,000 with liberal terms. Extra good 4-80 Continental, well located, should gin 4,000 or better this year. Priced for immediate sale at $50,000 with terms. These and many others you have to see to appreciate. Any gin I advertise or offer for sale will net its cost in two seasons operation. Call, write or see M. M. Phillips, Phone 5-8555, P. O. Box 1288, Corpus Christi, Texas.

MITCHELL MACHINERY FOR SALE — Late model, used very little. Four 66" super units, $850.00 each. Conveyor distributor, $700.00. Gas burner for drier, $450.00. Also conveyor, fans, shafting and bearings. Now in gin at Beggs, Okla. Buyer to remove.—G. N. Irish, Box 1567, Muskogee, Okla.

FOR SALE, FOR REMOVAL—5-80 saw Murray late type, loose roll, glass front, ball bearing, direct connected gin outfit, complete from wagon suction to press sale, as operated last season. Will be replaced by complete new plant. Equipment includes Mitchell super units, conveyor distributor, Murray big reel drier, 6-cylinder steel pressure cleaner, 72" Murray condenser, all steel up-packing press with tramper, and hydraulic power, seed sterilizer, etc. Powered with 6-cylinder Minneapolis-Moline natural gas engine and four electric motors for fans and press. Condenser only item over 10 years old. A fine value. 4-80 saw complete Murray gin outfit with or without steel building, glass front gins, Mitchell extractors, steel condenser, 14 foot steel overhead extractor, new 5-cylinder cleaner and 14-shelf tower drying system, seed scales, new fans. Electric power with V-belt drives. Plant belted up ready to run but has not operated since many items of new machinery installed. Price $25,000.00 or $21,000.00 if building not wanted. One 4-80 saw Cen-Tennial all steel ball bearing gin outfit, about 1937 model machinery. Equipment includes steel direct connected air blast gins, extracting feeders, conveyor distributor, cleaner and dropper, steel condenser, steel bound press with steel automatic tramper and hydraulic equipment, the usual fans, transmission and conveying equipment, bale scale and 15-ton, 9' x 34' Fairbanks truck scale, 100 h.p. Fairbanks-Morse, 2200 volt motor with V-belt drive. A complete plant at a very attractive price. We can furnish machinery for a good, efficient cotton gin at reasonable cost.—R. B. Strickland & Co., 13-A Hackberry St., Tel. 2-8141, Waco, Texas.

FOR SALE—Complete gin outfit consisting of 3-80 huller front Lummus air blast gins, 3 Lummus extractor-feeders, pneumatic elevating system, stub shaft, Continental wood press, condenser, all transmission, fans, etc. 75 h.p. internal resistance 550 volt motor, oil switch and 3 25 k.v.a. transformers from 6900 volts to 550; 22 ft. 6-ton scales. Will sell complete outfit and power for $2,500.00.—Mrs. R. L. Foster, McConnellsville, S. C.

FOR SALE—Five 80-saw Gullett air blast all steel gins, 1 60" all steel Gullett condenser complete with dust flue, supports and lint slide. 1 5-80 Gullett lint flue complete with gin hoods. 1 steel bound Gullett up-packing press only. 1 Dixie tramper. 1 50" CGC square steel condenser with dust flue, supports and lint slide. Write Box "BC", c/o The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

FOR SALE—One complete 4-80 Hardwicke-Etter gin. LeRoi engine power. Excellent condition. Insufficient cotton raised to justify continued operation.—Toller Bros., Fort Smith, Ark.

ELECTRIC MOTORS
Sales — Repairs

To better serve the Southwest cotton industry we now pick up and deliver FREE any equipment for sale or repair. Don't be shut down! Call us and we will deliver a loan motor to your plant free while we repair your equipment in our shop.

To further our aim to give fast and dependable service, we have established a motor repair shop at Harlingen, Texas.

Take advantage of factory-trained men, large copper wire availability, expert machinists, accurate balancing and testing equipment. Our facilities are as close as your telephone, and no more expensive than if done in your city.

Partial list of motors we have for immediate delivery:

1—800 hp. 3/60/2300/600 rpm, slip ring
1—250 hp. 3/60/440/600 rpm, slip ring
4—200 hp. 3/60/2200/900 rpm, slip ring
6—200 hp. 3/60/440/900 rpm, slip ring
4—150 hp. 3/60/2300/900 rpm, slip ring
2—150 hp. 3/60/440/900 rpm, slip ring
3—125 hp. 3/60/440/900 rpm, slip ring
2—125 hp. 3/60/2200/900 rpm, squirrel cage
2—125 hp. 3/60/440/900 rpm, slip ring
1—100 hp. 3/60/2200/900 rpm, squirrel cage
2—100 hp. 3/60/220/900 rpm, squirrel cage
4—100 hp. 3/60/2200/900 rpm, slip ring
2— 75 hp. 3/60/440/900 rpm, slip ring
2— 75 hp. 3/60/220/1200 rpm, squirrel cage

Fan and Press Pump motors and all other ratings in stock.

CALL ON US — DAY OR NIGHT — ANYWHERE

Complete starting equipment available for above motors.
Free rental while we repair your motors.

W. M. SMITH ELECTRIC CO.

Phone HUnter 2801 DALLAS — TEXAS — Phone 3905 HARLINGEN

FOR SALE—4-80 saw Murray, 6" mote conveyor, direct connected gins. One Murray steel bound press, with ram and casing. One Dixie tramper. One Murray horizontal triplex hydraulic pump. One 60" Murray steel condenser. 5-80 belt distributor and lint flue. One set of double hopper seed scales. One Murray 6-drum incline cleaner. One Gullett separator. Two 40" Murray fans. Will sell all or any part at an extra low price.—Clarence Wolf, P. O. Box 35, Rosebud, Texas.

COTTON GIN BUILDINGS—All steel—completely prefabricated, ready to bolt together. Can be modified for any type of gin operation, for immediate shipment anywhere in the U.S.A. — Marvin R. Mitchell Steel Bldg. Co., 1220 Rock Island, Dallas, Texas, Phone RAndolph 5615.

FOR SALE—Complete 4-70 Murray air blast gin to operate or move with Murray airline cleaner, dropper, belt distributor, condenser, packer, steel bound press, Mitchell feeders, 75 h.p. Fairbanks-Morse oil engine, International U-4 power unit for cotton house unloader, Continental dropper, scales 6 ton, 8 x 22 platform, steel sills. Gin building, seed house, cotton house, office, all iron clad. 5 lots. Will start machinery.—Frank Raney, Stigler, Okla.

FOR SALE—For removal a complete 5-80 Murray plant has bur extractors and drying system. 240 h.p. Climax butane engine, all in good shape. Also one 1946 Continental Munger brush. 30 huller front gin. Write Box "DE," c/o The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas 1, Texas.

FOR SALE—One 50" all-steel Hardwicke-Etter air line cleaner. One 40" Continental air-blast fan. One 40" Boardman suction fan. One 4-80 Hardwicke-Etter lint flue. One 4-80 Continental lint flue. 4-80 saw Munger brush DC gin stands. One 60" Hardwicke-Etter all-steel condenser.—Hughston Sales Company, P. O. Box 348, Farmers Branch, Texas. Phone Dallas—Nichols 7-7175.

FOR SALE—To be moved, complete 4-70 Munger gin, 16 ft. Hardwicke-Etter burr extractor, new extractor feeders, electric powered. Price $5,000.00. Write Box "GH", c/o The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

FOR SALE—Rebuilt 4-80 Continental gin, equipped with 24-shelf Murray tower drier with Mitchell 2,000,000 B.T.U. Butane gas burner and 1,000 gal. Propane tank; Continental XX feeders; 7-cylinder incline cleaner; new model Continental separator; square all steel Continental condenser; steel bound Continental press with E. J. tramper; 100 h.p., 75 h.p., and 15 h.p. electric motors. New all steel gin building 24' x 90' with 22' wall with canopy over press and 24 x 24 full height suction shed. 75 bale cotton house with Stacey unloading and distributing equipment with 25 h.p. motor. New Continental 1500 lbs. capacity seed scale.—Sugarland Industries, Sugar Land, Texas.

FOR SALE—Will offer liberal discount on 4-80 set of new '52 model Lummus lint cleaners, complete with lint flue, uptake, and new Lummus condenser. This machinery delivered from factory last month and still in shipping crates. This equipment engineered for 4-80 Murray gins. Would also sell 4-80 Murray gins, late model dump roll with glass fronts, 6" mote conveyor, and 4 60" Mitchell special super units with V-belt drive. Write Box "FG", c/o The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

FOR SALE—Our entire gin plant is offered for immediate sale. Calvin North, Manager, Benavides Mill and Gin Co., Benavides, Texas.

FOR SALE—3 complete Continental 80-saw gins direct connected, steel bound Paragon press, E. J. tramper, 72" down draft Continental steel condenser, 75 h.p. motor, pump, fan, etc. All in good condition. Price $6,000.00 F.O.B. Winder, Ga. As is.—Winder Oil Mill Co., Winder, Ga.

FOR SALE—One above floor right hand metal lint flue for 4-80 air blast Munger gins. 4-80 saw Munger, direct connected, metal frame, wood type air blast gins. Shafting 2-15/16", 2-7/16", 1-15/16", heavy and light type floor stands with bearings. 45" Continental suction fan. Write Lowake Gin Co., Lowake, Texas.

FOR SALE—4 direct connected 80-saw Pratt brush gins with lint flue. 4-80 double X model A feeders. One set Hardwicke-Etter seed scales with rotor lift. One Hardwicke-Etter 50 in. flat screen separator, also 9 in. conveyor and 1-15/16 in. shafting with bearings and stands.—Service Gin Co., Taft, Texas.

COMPLETE modern gin for sale to be moved. 4-80 all steel Murray gin, air blast, direct connected 6" mote conveyor. Super Mitchell conveyor distributor. Electric power. P. X. press. All-steel down draft condenser. Mitchell dryer. Gin building, cotton house, seed house. All-steel Braden buildings. 34 foot scale. Excellent condition $25,000.00 F.O.B. Eastern, Oklahoma, Muskogee Cotton Oil Mill, Phone 8118, P. O. Box 1567, Muskogee, Okla.

FOR SALE—One Cen-Tennial press pump and pulleys, ram, casing and fittings. One 1 million BTU burner. One Cyclone separator, burr separator. All above equipment in perfect working order. Prices right.—T. B. Gilbert & Co., Inc., Wisner, La., Phone No. 3.

FOR SALE—A 4-70 Lummus gin plant, complete with caterpillar 6-cylinder diesel engine, up-packing press.—J. P. McAfee, Wylie, Texas.

FOR SALE—1 Lummus steam thermo cleaner, 1 70 inch Lummus condenser with DeVilbiss suction fan, one 6 80 lint flue. This machinery at half price.—Willamar Gin Co., San Perlita, Texas.

FOR SALE—As a unit, to be moved. Installed new 1948, ginned less than 3,000 bales, the following Gullett complete drying and cleaning equipment. One 6-drum cleaner with vacuum feeder, one 4-drum cleaner with vacuum feeder, one 50" RAL separator with built-in vacuum feeder and double blow box, one 14 foot burr machine complete with steel platform and 25 ft. of 12" R. H. conveyor in steel box, one 14-shelf tower dryer, one 1 million BTU gas burner, one 40" cast iron, hot air fan with V-belt drive, one 35" cast iron hull fan with V-belt drive, one 75 h.p., 2300 volt, 900 r.p.m. motor with starting equipment. Also includes line shaft, pulleys, belts, and all pipe used in the present setup.—Banner Roller Mills, Inc., Lincolnton, N. C.

FOR SALE—One 66 inch pressed steel flat belt F.E.C. Mitchell machine. One 80-saw air blast Murray gin, glass front. One 60 inch pressed steel V-belt F.E.C. Mitchell machine with hot air connections. One 2-hopper Fairbanks seed scales. All steel Continental air line cleaner.—J. O. Williams, Frost, Texas, Phone 100.

FOR SALE—To be moved. Late model 3-80 all steel Continental gin complete with steel building. Ginned less than 5,000 bales. $20,000.00. Call Max Davidson, Tel. 34-8146, Memphis, Tenn.

FOR IMMEDIATE SALE—5-80 Murray gins, new type glass fronts, $500.00 each. 1 complete lint flue for 5-80, 250.00. 1 Gullett 6-drum incline cleaner, 400.00. 1 new Murray saw cylinder never uncrated, 40% discount. 5 M-100 Gullett 1949 extractor feeders, 300.00 each. 1 Gullett air separator, 125.00. Or all goes for $4,500.00.—County Line Gin, Morton, Texas.

FOR SALE—4-80 1948 F3 AB Continental gins rebuilt like new. 5-80 Murray gins with 6-in. mote conveyor. 4-80 model C all-steel Continental brush gins with 30 fronts. 4-80 model C all-steel air blast gins with 30 fronts. 5-80 Murray gins with glass fronts and roll dump. 6-80 Cen-Tennial all-steel gins with Commander loose roll fronts. 5 52" V-belt standard Mitchells. 4 60" standard Mitchells with flat belt drive, A-1 condition and equipped for drying. 5-60 convertible Mitchells with flat belt drive. 1 14' Hardwicke-Etter wood burr machine. 1 8-cyl. steel inclined Wichita cleaner. 1 14' Lummus steel burr machine with 4-cyl. 8' cleaner and 72" type M separator. 1 52" Stacy steel horizontal cleaner. 2 52" 6-cyl. Murray horizontal cleaners. 2 Mitchell 6-cyl. Jembo cleaners. 1 12 section thermo-cleaner. 1 66" V-belt standard Mitchell. 1 60" V- belt standard Mitchell. 1 section Mitchell distributor for 60" gins. 1-80 saw model E Continental brush gins. 1 Gullett steel press, tramper and 72" down discharge condenser. 1 Lummus steel tramper. 1 60" new Lummus side discharge condenser in Mississippi. —Bill Smith, Fulwiler Bldg., Ph. 4-9626 or 4-7847, Abilene, Texas.

Equipment Wanted

WANTED—5-80 Continental F-3, direct connected, V-belt driven brush gins.—Orb Coffman, Goree, Texas.

WANTED—Four or five stand late model gin to be moved including building, scales and seed house.—T. N. Parker, 701 N. Main, Fort Worth.

WANTED—One 80-saw Lummus double moting gin stand. One 80-saw Lummus M.E.F. feeder. One section conveyor-distributor complete. One section lint flue press end. Write Box "HE" in care of The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

WANTED—Set of good used truck scales with minimum length and capacity of 34' and 15 tons. —A. C. Lyle, Route 2, Brownfield, Texas.

WANTED TO BUY—Continental impact cleaner, old style preferred.—Skene Gin Co., Skene, Miss.

WANTED—Lummus or Hardwicke-Etter tramper with kicker, also a 25 or 30 h.p. electric motor, in good condition. Address, Gin, P. O. Box 38, Pattison, Texas. Give price.

WANTED—Power unit. Fairbanks slow-speed type YVA or equivalent. 75 to 100 horsepower. —Johnson Cotton Company, Dunn, N. C. Attention W. G. Smith, secretary-treasurer.

WANT TO BUY—Two or three duo expellers. —Baker Rendering Company, 4073 Bandini Blvd., Los Angeles 23, Calif.

WANTED — One model 88 Gullett extractor. — Clarence F. Landry, R.F.D. 1, Box 16 D, Lafayette, La.

WANTED—2 or 3 Carver linters, saw sharpener and shafting, belting and bearings for above.— 419 West Street, Stillwater, Okla.

WANTED—One 5-80 steel condenser. One 5-70 saw Mitchell hull extractors.—W. A. Herrmann, 838 Key Street, Houston 9, Texas.

WANTED: For removal—late model good used diesel powered 5-80 or 4-90 Murray gin outfit complete with dryer, cleaners, burr extractor and steel building. Write Box "ATM", c/o The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas 1, Texas.

WANTED—Good used expeller oil mill machinery. —American Tung Mills, Inc., Florala, Ala.

WANTED—All steel 14 ft. Hardwicke-Etter burr machine. One 5-cylinder, one 7-cylinder, type I 50 inch steel cleaners and a Camerun tramper.— J. O. Williams, Frost, Texas, Phone 100.

Do you have some gin or oil mill equipment for trade or sale? Classified ads in the "Press" are read by ginners and oil millers from California to the Carolinas, every-other-Saturday.

Personnel Ads

WANTED—Ginner capable of repairing and handling Murray air blast gins, etc. Diesel engine. Immediate work.—H. W. Hillman, 213 S. Menefee, Edna, Texas.

WANTED—Gin man, who can repair and manage a gin for year round work. State experience and salary expected in first letter. Write Box "CD," c/o The Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas 1, Texas.

WANTED—Job as manager of gin. Nine years experience, reliable references. Age 37. Don't drink. Mathew H. Goodrich, Lamesa, Texas.

Power Units and Miscellaneous

ALL STEEL BUILDINGS—Any size, any shape, for any desired use — warehouses, cotton seed houses, gin buildings, etc. Newest design, completely prefabricated and ready for immediate shipment anywhere in the U.S.—Marvin R. Mitchell Steel Bldg. Co., 1220 Rock Island, Dallas, Texas. Phone RAndolph 5615.

FOR SALE—1 Skinner steam engine, top shape. 1 boiler, 72 x 18 and steel jacket. 1 heater. 1 Mitchell steam dryer. 1 good smoke stack. All this can be bought right. Contact Mark Allen, Loop, Texas.

FOR SALE—1 rebuilt model 1210-12A Moline engine 220 h.p. 2 rebuilt 8 x 9 4-cylinder Moline engines 150 h.p. 1 rebuilt 35 h.p. Moline engine. New Moline engines in stock for immediate delivery. Call us for parts and service day or night. —Fort Worth Machinery Co., 913 East Berry, Fort Worth, Texas.

FOR THE LARGEST STOCK of good, clean used gas or diesel engines in Texas, always see Stewart & Stevenson Services FIRST. Contact your nearest branch.

FOR SALE—One 250 h.p. 12-cylinder GMC diesel engine, clutch, V-belt drive. Three 240 h.p. Fairbanks-Morse diesel units. Three 360 h.p. Fairbanks. Several gas engines, 165 to 300 h.p. I buy, sell or trade.—A. C. Askew, Box 3073, Whittier Sta., Tulsa 8, Okla.

FOR SALE—150 ft., 6 ply, 12 in. rubber belt. In good condition, $1.00 per ft. for what you want. One 35 h.p. locomotive type boiler, really a good efficient boiler. One steam feed pump.— Skene Gin Co., Skene, Miss.

FOR SALE—One 110 h.p. Bruce-Macbeth engine with Hill clutch.—W. S. Peck Gin, Sicily Island, La.

FOR SALE—One model E, 8 x 9, 6-cylinder Moline engine. Completely rebuilt.—Fort Worth Machinery Co., 913 E. Berry St., Fort Worth, Texas.

FOR SALE—135 h.p., Bessemer gas engine, 2-cylinder, horizontal, good condition. Includes motor driven air compressor, air tank and water pump. Price $750.00. Buyer to remove from gin at Beggs, Okla.—G. N. Irish, Box 1567 Muskogee, Okla.

FOR SALE—One steam cottonseed sterilizer. Good condition.—Eckhardt Gin Co., Yorktown, Texas.

FOR SALE CHEAP—Pulleys, almost any size.— Bishop Gin, Inc., Bishop, Texas.

SPECIAL—Cotton gin engine, 224 h.p. LeRoi in first class condition equipped with cast iron base, outboard bearing, 10-groove 18" V-sheave, twin ignition, auxiliary water pump, 4-cyl. LeRoi starting engine and air cleaner. Equipped for either natural gas, gasoline or butane fuel. Call or write Bell Hardware & Implement Company, Donna, Texas.

FOR SALE—150 h.p. Fairbanks-Morse engine. Needs some repairs. Make offer as is and where is.—Hiliey's Gin, Elgin, Texas.

FOR SALE—1 120 h.p. 2-cyl. full diesel Fairbanks-Morse type Y engine. 1 125 h.p. Cooper-Bessmer 2-cyl. diesel engine. 1 150 h.p. Climax natural gas or butane engine. 1 40 h.p. LeRoi natural gas or butane engine with radiator. 1 1950 model V-12 LeRoi engine.—Bill Smith, Fulwiler Bldg., Ph. 4-9626 or 4-7847, Abilene, Texas.

The Argentine Oilseed Situation for 1952

USDA reports that quantities of linseed oil for export from Argentina will be relatively small throughout 1952. Surpluses previously existing for both flaxseed and oil were liquidated by large shipments in 1951. The crop now being harvested is the smallest since Argentina became a major producer, insufficient even to keep the domestic crushers operating. Maximum exports this year are forecast at 110,000 short tons of linseed oil and possibly 790,000 bushels of flaxseed, comparing with 286,600 tons and 7,183,000 bushels, respectively, in 1951.

The situation with respect to edible oils is comparatively good. Sunflower seed was planted under favorable conditions with acreage apparently increased from last year, partly as a replacement for wheat failures. Cotton plantings are the largest on record, peanuts may be moderately above 1950-51, and a good olive crop appears likely. The exportable surplus of edible oils from coming harvests may reach 140,000 tons.

Stocks of exportable oilseed cakes and meals on Jan. 1 were relatively large because prices were high and sales were small during 1951. Argentina in 1952 may be able to export about 770,000 tons compared with an estimated 440,000 tons last year.

• **Cottonseed**—The area in cotton this season is estimated at 1,360,000 acres, almost 15 percent over last season and the largest on record. If yields are good, the production of cottonseed may exceed considerably the 210,000 tons (commerical production) estimated for last year. Production of cottonseed oil, calculated at 21,000 tons during the present crushing year, is likely to rise moderately, filling local requirements and providing a small export surplus.

• **Peanuts**—Peanut planting was delayed by drought but there was much interest late in the season after rains made planting possible. Trade sources believe the area is near 310,000 acres, somewhat above the 301,200 acres reported officially (revised figure) last season. Growing conditions to date have been fairly good and production of about 110,000 tons, shelled basis (or 165,000 in shell), appears possible, compared with 100,000 tons (revised figure) shelled basis (or 150,000 in shell) last year.

During the present crushing season (April 1951-March 1952), production of peanut oil is expected to be about 22,000 tons. The 1951-52 crop should permit similar or slightly greater output. All of the peanut oil is used in Argentina, largely in blends with sunflower seed or olive oil.

New Mexico Gets Additional Peanut Acreage Allotment

An additional allotment of 1884 acres for Valencia and Virginia types of peanuts has increased New Mexico's total peanut acreage to 6,983 acres for 1952, according to a recent announcement from the Secretary of Agriculture.

The increased acreage allotment will be prorated according to the average acreage of Valencia and Virginia types of peanuts grown on each farm in 1949, 1950, and 1951. Other states sharing the national increase of 32,639 acres for 1952 are Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, and Virginia.

Cen-Tennial Chief Engineer, W. L. Steinhauer, Dies

The death early in February of W. L. Steinhauer, chief engineer of Cen-Tennial Cotton Gin Co., of Columbus, Ga., was a blow to his family, his company, and his many friends in the ginning industry. He had been with Cen-Tennial since 1936 and "was one of our top men and a very loyal employee," in the words of a company official.

He is survived by his wife, Mrs. Katherine McGee Steinhauer; his father, Frank C. Steinhauer, Atlanta; a daughter, Jane Steinhauer Price, Columbus; two brothers, John and Steed Steinhauer, Atlanta; and two granddaughters.

Fresno Designated as Spot Cotton Market

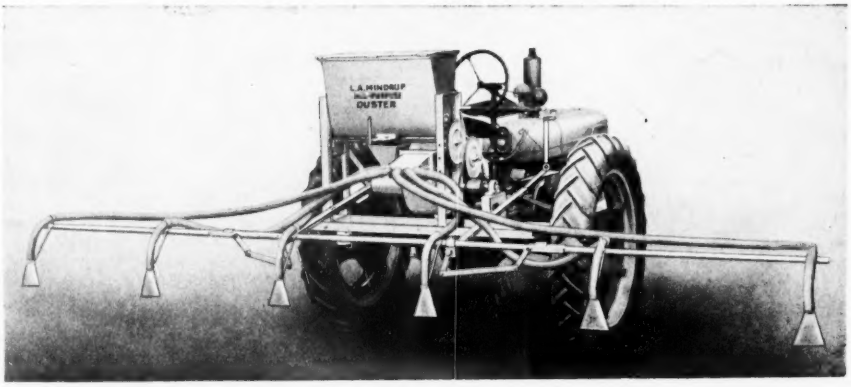
Effective March 21, Fresno, Calif. will be designated as a bona fide cotton spot market under the Cotton Futures Act. It is the first market in the far western cotton producing states to receive this recognition.

The 12 bona fide markets now designated are Atlanta, Ga.; Charleston, S. C.; Augusta, Ga.; Montgomery, Ala.; Memphis, Tenn.; Little Rock, Ark.; Dallas, Lubbock, Houston, and Galveston, Tex.; New Orleans, La.; and Fresno, Calif.

L. A. MINDRUP ALL-PURPOSE DUSTER

HAS LARGE BALL BEARING FAN which assures high pressure at the nozzle opening.

This is very essential for complete coverage of the plant. The under side of the leaves are dusted as well as the top.



The tractor mounted type, as shown, is driven from the side pulley on the tractor. We also have the same duster mounted on a trailer which is driven from the power takeoff.

THE L. A. MINDRUP ALL-PURPOSE DUSTER has the most perfect feed control of any duster on the market. The large dust hopper has two compartments for two different kinds of insecticides, and they are fed into the fan in any proportion. The mixture can be varied from less than 1 percent of one insecticide to 99 percent of another, or any proportions desired, and the feed remains constant without variation until changed. There is quite a saving in buying them separately, instead of ready mixed, and there is the added advantage of being able to vary the proportions used to suit the requirements, at the time of dusting. Write us for Dealership in your territory.

MANUFACTURED BY **THE STACY CO., INC.** 2704 TAYLOR ST., DALLAS 1, TEXAS

A WELL-FRUITED PLANT from a field that was protected from insects.

In '52: Save the Bolls - Produce the Bales

Fighting Cotton Insects

By Dr. F. C. BISHOPP

■ INSECTICIDES are important, but there are other ways to fight cotton pests, the author points out. And one of the most effective ways of all is early stalk destruction.

THE PRODUCTION of 16 million bales of cotton along with a step-up in many other crops is a big order for 1952. It can be done and I'm sure it will be. Reasonably favorable weather, good seed, considerable fertilizer, proper soil preparation and tillage, adequate insecticides, some brains, and much sweat will be required.

We can't do much about the weather but we can take some advantage of it by planning and foresight.

Insecticides are certainly one of the necessities in cotton production. But it isn't as simple as just putting on plenty of insecticides. We have all seen cases where a grower has applied insecticides 6 or 8 times and made no more cotton than his neighbor who used none.

We must know whether a pest killer is needed, what chemical material is best, that it is properly prepared, that it is put on at the right time, in the right amount, and especially in the right way.

Farmers should study the recommendations of their state Experiment Station and Extension Service for the control of the pests commonly found on cotton in their state. The county agent should be consulted about local insect conditions. Next the farmer should learn all he can about the appearance and abundance of the insects attacking his crop.

Dr. F. C. BISHOPP is Assistant Chief, Bureau of Entomology and Plant Quarantine, U.S. Department of Agriculture, Washington.

In general, insecticides prepared by reliable companies are exactly what is claimed on the label. Those claims, directions, and safety measures should be followed to the letter. That means that the label should be read carefully—not once, but 2 or 3 times if necessary to fully understand every detail.

In timing the application of insecticides, the farmer should follow the general principle outlined by the Experiment Station and Extension Service, but he must depend on himself or men employed by him to check infestations in his own fields.

In areas where boll weevils and thrips are always bad and an early treatment program is carried out on a community basis, the size of the cotton is the main guide to beginning insecticide applications.

Directions as to the right amount of poison to use should be followed closely. The grower must know how much is being put on per acre regardless of whether applied by airplane, by power outfit, or by hand.

Proper application is equally as important as the material used. To get good application the dusting or spraying equipment must be in good condition and nozzle output checked repeatedly. Dusts require proper agitation to keep the discharge uniform and thorough agitation of sprays is of great importance. Never apply insecticides when it's very windy. Dusts should not be put out when there is more than a 5- or 6-mile wind, and sprays when the wind exceeds 15 miles per hour. The less air movement, the better. The grower should try not to make an application just before a rain.

Too many farmers leave the application of insecticides to hired help or to the pilot. Supervision of such operations is essential and fields should be flagged when planes are used.

Precautions

The points outlined are essential to effectively control cotton pests and some of them are important for safety. Much criticism is being heard today of farmers and others handling pest-killing materials carelessly. It is claimed that soils are being damaged by too much insecticides, that fish and wildlife are suffering, and that public health is being endangered. There is demand for the passage of laws to curb the free use of pesticides. Although it is certain that many of these claims are unwarranted, it is obvious that pesticides must be used properly so there will be no basis for complaints.

Trouble will be avoided and insecticides saved if attention is given to the following:

1. Insecticides are poisons and they should be handled and stored as such.
2. Do not breathe or let the body be exposed unnecessarily to sprays or dusts.
3. Bathe and change clothes when a job is finished and do not wear clothes that have been contaminated with insecticides until washed.
4. Wash hands with soap and water before eating.
5. If very dangerous materials such as parathion are used, wear a respirator of the right type to give protection and change filter pads often.
6. Follow recommendations on the avoidance of ill effects on honey bees.
7. Do not apply insecticides over city water supplies or streams and ponds where fish abound.
8. Do not empty spray tanks where the material will get into streams or be drunk by livestock.
9. Never mix insecticides near a well or spring.
10. Avoid applications to wildlife areas as far as possible.
11. Do not permit insecticides to drift onto pastures or gardens.
12. Do not apply any more insecticides

to the crop than necessary. Heavy accumulations of some insecticides in the soil may adversely affect crops in following years. This is especially true of sandy soils, lacking in humus.

13. Do not apply benzene hexachloride (BHC) to cotton growing on land that is to be planted to potatoes or peanuts the following season, as those crops may be thrown off-flavor.

Those are a lot of don'ts, but observing them may save much worry and money.

Available Insecticides

We now have many kinds of insecticides with which to fight cotton pests. There is no one material or combination of materials that will effectively control all pests under all conditions. Information on the various insecticides and how they fit into the pest control program is given in other articles in this issue.

The insecticides discussed are generally available, but there are some shortages. Sulfur, that valuable diluent and mite killer, is one of the materials in short supply. It is not needed in fighting pests east of the Mississippi River, but spider mites are usually not a serious pest there, and if they do become troublesome they can be controlled with some of the new compounds, such as parathion, TEPP or Aramite.

The idea of getting poison into plants so as to kill or repel insects has a strong appeal. Many compounds, mainly phosphates, are under test as systemic poisons. Much of the work is on a material with a long chemical name that is now commonly called Schradan or OMPA.

The application of Schradan to cottonseed or to the soil around the plants had been found to be taken up by the plants and to give them protection against aphids and spider mites for a few weeks. Unfortunately this material does not kill boll weevils or other chewing insects feeding on the treated plants.

The use of systemic insecticides as applied to cotton is still in an exeprimental stage but the outlook is hopeful.

Since the demand is heavy for insecticides, all around the world, as well as for base materials required for their manufacture, it is desirable that every cotton raiser place orders early for at least one-fourth of his anticipated needs.

Don't Depend Entirely on Insecticides

We are all inclined to put too much dependence on insecticides. Remember there are other ways to combat cotton pests than by their use.

Reasonably early and uniform planting, good seed of rapid maturing varieties adapted to a given locality, proper cultivation, and especially early stalk disposal, all tend to lessen insect damage. Doubtless, a big cotton crop will be needed in 1953 and plans to clean up cotton stalks early next fall is a first requirement. This is to help meet the serious pink bollworm situation and to reduce the likelihood of a heavy carryover of boll weevils.

State Guides

(Continued from Page 62)

may take several years work with them to determine the facts. Other hazards of these materials have been mentioned in previous paragraphs.

1952 Cotton Insect Control Recommendations for:

Georgia

Recommended Dusts for Boll Weevil Control

(1) BHC-DDT—A mixture containing 3% gamma isomer of benzene hexachloride and 5% DDT (3-5 mixture) in an inert carrier. Use at the rate of 10 to 15 pounds per acre.

(2) Toxaphene — A dust containing 20% technical toxaphene in an inert carrier. Use at the rate of 10 to 15 pounds per acre.

(3) Aldrin-DDT — A mixture containing 2.5% aldrin and 5% DDT in an inert carrier. Use at the rate of 10 to 15 pounds per acre. Under extremely hot conditions, especially in south Georgia, the rate per acre should be increased to 15 pounds.

(4) Dieldrin-DDT—A mixture containing 1.5% dieldrin and 5% DDT in an inert carrier. Use at the rate of 10 to 15 pounds per acre.

(5) Calcium Arsenate in alternate applications with BHC-DDT (3-5 mixture). Use calcium arsenate at the rate of 7 to 10 pounds per acre. Apply BHC-DDT at 10 to 15 pounds per acre.

(6) Lime-free Calcium Arsenate plus 1% Parathion Mixture—Use at least 10 pounds per acre. (See precautions for parathion)

When certain of these insecticide mixtures are used other pests may have to be considered (See bollworm, cotton aphid, and red spider mites). In large or rank growth cotton the recommended number of pounds should be increased.

Hand guns, horse-drawn, and tractor mounted dusters or airplane dusting are all satisfactory for application.

Recommended Sprays for Boll Weevil Control

(1) Toxaphene or Toxaphene-DDT — Apply toxaphene at the rate of 2 pounds of technical toxaphene per acre. Where DDT is included in the concentrate the rate per acre should be 0.5 pound of technical DDT.

(2) Aldrin-DDT—Apply at the rate of 0.25 pound technical Aldrin and 0.5 pound technical DDT per acre.

(3) Dieldrin-DDT—Apply at the rate of 0.15 pound technical dieldrin and 0.5 pound technical DDT per acre.

(4) BHC-DDT—Apply at the rate of 0.3 pound gamma isomer BHC and 0.5 pound technical DDT per acre.

When certain of these insecticide mixtures are used other pests may have to be considered (See bollworm, cotton aphid, and red spider mites).

7 CHEMICAL LABORATORIES TO SERVE YOU

★ Memphis, Tenn.
★ Little Rock, Ark.
★ Blytheville, Ark.
★ Cairo, Ill.
★ Des Moines, Iowa
★ Decatur, Ill.
★ Clarksdale, Miss.

WOODSON-TENENT LABORATORIES

Main Offices: MEMPHIS, TENN.

Specializing in analyses of Cottonseed, Soybeans and their products, Fats — Feeds — Fertilizers

REES
COTTON GIN REFUSE BURNER

An engineered and proven Refuse Burner adapted from a similar Burner used for many years in the woodworking industry.

Controlled draft to take care of any burning condition — from cleanly hand-picked cotton to heavy burrs and trash from snapped and stripped cotton.

Ask for descriptive bulletin and users list.

VISIT OUR DISPLAY AT THE MID-SOUTH GINNER'S SHOW

Memphis Machinery & Supply Co., Inc.

205 South Front Street

Phone 37-4443 MEMPHIS 1, TENN. P. O. Box 225

See section on spraying for details on application.

Other Insecticides

Heptachlor—Heptachlor was used experimentally for cotton insect control in many locations throughout the Cotton Belt in 1951 and will be recommended in a number of states during 1952. It was effective in controlling the boll weevil, thrips, and cutworms. It did not control the bollworm and therefore DDT should be added for control of this pest. This insecticide has been tested for only one year in Georgia. Results compare favorably with other insecticides recommended for boll weevil control and tests will be continued.

Timing of Applications for Boll Weevil Control

Pre-square — Early applications are recommended where boll weevil, thrips, fleahopper, or other injurious insects are numerous early in the season.

After Squaring Begins—When squaring begins examine the fields. If punctured or flared squares are readily found, apply any of the recommended materials. In most years the regular schedule commences with this application. Applications should be made at **four** to **five** day intervals until the infestation is brought under control. This will probably require at least three applications. Fields should be watched closely and poisoning resumed when reinfestation occurs. Presence of insects and weather conditions will determine the total number of applications during the season. **Do not stop too early.** If conditions are such that ground equipment will damage the plants, fenders or guards should be used. When it is impossible to get in the field late in the season, airplane application is recommended. If rain occurs within 24 hours after poisoning, repeat application within 48 hours.

Other Insects

Bollworm—If this pest is not controlled by the boll weevil schedule, apply a dust of either 10% DDT or benzene hexachloride 3% gamma isomer and DDT 10% (3-10 mixture) at the rate of 10 to 15 pounds per acre. The BHC-DDT (3-10) controls boll weevil, bollworm, and aphid. When spraying is being practiced and the emulsifiable concentrate used does not contain DDT, add DDT concentrate to give 1 to 1.5 pounds of technical DDT per acre. Toxaphene, at the rate of 2 to 4 pounds of technical toxaphene per acre, is the next most effective insecticide against bollworms. Applications should be made as soon as terminal leaves are injured or when squares with small holes in them are found. Prompt action is essential as large worms are difficult to kill. Late season applications are particularly important for control of bollworms.

Aphid—Where a build-up of aphids or lice occurs apply BHC-DDT (3-5) or 1% parathion dust. Where sprays are being used apply BHC or tetraethyl pyrophosphate (TEPP). TEPP may be combined with other spray formulations and is used at the rate of 0.5 pint of 40% TEPP, or its equivalent, per acre. (See precautions for parathion and TEPP).

Red Spider—A 1% parathion dust, applied at the rate of 10 to 25 pounds per acre, is effective in controlling spider mite infestations. As a spray, parathion is used at the rate of 0.10 to 0.25 pound of technical per acre. Tetraethyl pyrophosphate (TEPP) at the rate of 0.5 pint of the 40 percent concentrate, or its equivalent, per acre, effectively controls heavy populations but its effectiveness is of short duration. Dusting sulfur at the rate of 20 to 25 pounds per acre may be used but is considered less effective than the above materials. The supply of sulfur will be short during 1952. (See precautions for parathion and TEPP)

Thrips—In some areas thrips may seriously injure seedling cotton. This insect may be controlled with the dusts or sprays recommended for boll weevil control, except calcium arsenate. When applications are made to seedling cotton the recommended rate per acre may be reduced one-half for thrips control.

Cutworms—Twenty percent toxaphene or 10 percent DDT dusts applied at the rate of 10 to 15 pounds per acre are effective. Aldrin-DDT dust gave good results in some areas in Georgia during 1951. Toxaphene and toxaphene-DDT sprays applied at the rate of 2 to 3 pounds of technical toxaphene per acre, DDT spray at 1 to 1.5 pounds of technical DDT per acre, and dieldrin at 0.375 to 0.5 pound of technical dieldrin per acre are also effective.

Fleahopper—This insect may be controlled with the dusts or sprays recommended for boll weevil control, except calcium arsenate.

Cotton Leafworm—This insect may be controlled with either calcium arsenate, BHC-DDT (3-5 mixture), or toxaphene.

Spraying

Insecticides may be applied in the spray form and give equal results to dust

(Continued on Page 104)

ATLAS

Insecticides Are Superior

"Know How" in the process of manufacture produces cotton insecticides with greater killing power.

Aldricide 2½-0-0
Aldricide 2½-5-0
Aldricide 2½-5-40
Aldricide 2½-10-0
Aldricide 2½-10-40
Aldricide Emulsion
(Contains 2 lbs. Aldrin Equivalent per gallon)

BHC 3-5-0
BHC 3-5-40
BHC 3-10-0
BHC 3-10-40
Toxaphene 20% Dusts
Toxaphene 40% Concentrate
Toxaphene Emulsions

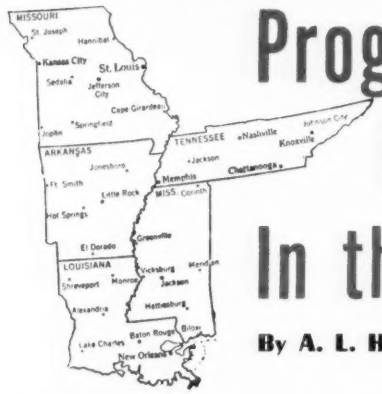
Dieldrin Dusts
Dieldrin Emulsions
Aldrin 20% Dust Base

DDT Dusts
DDT Emulsions
DDT 50% Dust Base

ATLAS CHEMICAL CORPORATION

Waynesboro, Georgia — St. Louis, Missouri

In '52: Save the Bolls - Produce the Bales



Progress of Cotton Insect Control In the Midsouth

By A. L. HAMNER

A. L. HAMNER is Associate Entomologist, Mississippi Agricultural Experiment Station, State College.

■ RESEARCH in developing and proving insecticides has not exceeded the rapid advance in getting information to the farmer, the author points out. Extension workers and interested agencies are taking more information to the farmer than ever before.

THE ENTRY of the boll weevil into the Mid-South around 1904 and its spread in a few years to all of the area to which it is adapted marked a new era in cotton production. Until that time the bollworm, cotton leafworm, cotton aphid and red spider were the only recognized pests of any importance and occurred only occasionally. The coming of the boll weevil created so much interest that in 1910 a bulletin was issued in which 17 insects were illustrated and several others mentioned which had been mistaken for it. Following its entry aphids, fleahoppers, tarnished plant bugs, thrips, bollworms and red spiders have become recognized as pests of importance or increasing importance.

Because of the lack of suitable chemicals, the early control measures were based on cultural practices patterned after those of Texas. Early planting, early fall destruction of stalks, shallow cultivation, use of commercial fertilizers and early maturing varieties were commonly recommended. Early planting as a direct measure of control was readily accepted and has been used advantageously since. Early destruction of stalks has been rather consistently recommended but has never been practiced to any great extent. The value of fertilization, early maturing varieties and shallow cultivation have never been measured as control measures. Without doubt, they have an important influence, but the real value is masked by the many other factors that affect production. Many mechanical devices designed by entomologists and local inventors were tested, but none of these proved to be very effective.

Calcium arsenate was the first insecticide used that proved to be practical for the control of the boll weevil. Following tests conducted for the most part in Louisiana, Mississippi and Arkansas, it was generally recommended about 1920. Along with it came improved machinery for ground applications and the development of airplane dusting. These developments marked the beginning of large-scale use of insecticides for cotton insect control, especially where the boll weevil was a pest. The more progressive farmers soon started using it and for a few years boll weevil control was common. Those who used it less efficiently gradually "dropped out" and started depending largely on nature for control.

Calcium arsenate alone soon proved insufficient in many cases to give the necessary insect control. Infestations of the cotton aphid (an old pest of seedling cotton) following calcium arsenate for boll weevil control became of increasing importance. As more nitrogenous fertilizers were used it became a pest more and more consistently. Some of the earlier work on the amount of damage done showed that the honeydew excreted by the aphids that gummed up the lint was not the only damage done. Losses in yield of seed cotton were found to depend on the stage of maturity of the plant at the time the aphid infestation reached its peak. Control measures applied when the plants were only partially defoliated reduced the amount of damage.

Control measures for this insect were extremely difficult to devise at that time. Nicotine dust was the only highly effective insecticide known. Conditions required for it to be effective were so exacting that it was never popular.

Due to the difficulty experienced by the user of nicotine dusts in getting satisfactory control, the problem was approached from several angles. Such measures as controlling the initial infestation at the time the first application of calcium arsenate was applied, 1% nicotine in every application, 2% nicotine in alternate applications, mixtures of calcium arsenate and rotenone dusts, and mixtures of calcium arsenate and sulfur were tested. Studies of varietal resistence to the aphid and boll weevil were started. Fruiting habits and the relation of boll damage to the square infestation were studied to determine to what extent boll weevil control measures could be delayed. More satisfactory control measures were developed but they were not as economical as needed for the economic conditions that prevailed for several years. Some of this work was still in progress at the time the organic insecticides were introduced.

During this period the fleahopper and tarnished plant bug became of occasional importance. The power of the plant to recover from the loss of squares of the size damaged by these insects was demonstrated. As a result, infestations of these insects during the first two or three weeks of square production are no longer viewed with alarm on early planted cotton except where early maturity is desired.

Thrips became more important with the increase in the use of cover crops and small grains. The damage caused by these insects, except the occasional poor stands, is a delay in the onset of fruiting. In this respect its damage is similar to that of the fleahopper and causes no great concern except where early maturity is desired. For many years no insecticidal control measure was known.

A PERFECT COMBINATION:

SATISFIED CUSTOMERS

&

GUARANTEED DEALER PROFIT

Policy

SOLD EVERYWHERE BY QUALITY SEEDSMEN

THE SINKERS CORPORATION
KENNETT, MISSOURI

Immediately before the introduction of the organic insecticides some progress was being made with varietal resistance studies.

The organic insecticides were a great boon to the control of injurious cotton insects. The larger number of kinds of insects that each would control provided a means for the greatest progress in the use of insecticides ever experienced in cotton insect control. Their suitability for use as low gallonage sprays, as well as dusts, and the adaptation and development of spray equipment for use on cotton, placed within reach of every cotton grower insecticides and equipment suitable for his farm. Six proven insecticides instead of one for boll weevil control; three satisfactory instead of one more or less unsatisfactory for aphid control; several that satisfactorily control thrips, cotton fleahoppers and tarnished plant bugs; a more satisfactory control for the bollworm along with control measures for many minor pests have given the farmer new hope and confidence.

The newer insecticides which can be used without the hazards associated with calcium arsenate along with some additional information on the fruiting cycle of the plant have revived interest in early season control of the boll weevil. Recommendations where made for early season control are based on the seasonal cycle of the insect, the infestation and development of the plant rather than on the infestation and development of the plant alone.

Research in development and proving insecticides did not exceed the rapid advances made in getting the information to the farmer. Two successive years in which the boll weevil was a very serious pest created as great a demand for information as had ever occurred. The farmer became, and remains, insect conscious. The Extension entomologist and his co-workers, other agricultural agencies, farm and trade journals are carrying more information to the consumer than ever before. The farmer himself has made great progress in insect control in the last seven years, perhaps more than all the previous 25 or more years in which he has fought or tolerated the boll weevil and other pests. His recognition of the importance of insects, eagerness for more information, quick evaluation of the different insecticides, etc., have certainly set a standard with which all future work may well be compared.

The rapid advances in the Mid-South have not been made without the apparent introduction of some handicaps. Bollworms and red spiders until a few years ago were recognized as pests of occasional importance on cotton. The occurrence of increasing damage in the past three years shows that no panacea has been found. Additional advances must be made.

The research facilities of many chemical manufacturers are even now developing and testing new economic poisons and it is to be hoped that out of these laboratories and out of the laboratories of state and federal agencies there will eventually appear new and more effective methods of cotton insect control.

Stauffer
CHEMICALS
SINCE 1885

STAUFFER SPRAY CONCENTRATES
for 1952

Stauffer DDT Emulsifiable Concentrate—No. 201
1 gallon contains 2 pounds DDT

Stauffer Parathion E. C.—No. 401
1 gallon contains 4 pounds Parathion

Stauffer Parathion E. C.—No. 202
1 gallon contains 2 pounds Parathion

Stauffer Toxaphene E. C.—No. 801
1 gallon contains 8 pounds Toxaphene

Stauffer Toxaphene E. C.—No. 601
1 gallon contains 6 pounds Toxaphene

Stauffer Toxaphene-DDT E. C.—No. 40-20
1 gallon contains 4 pounds Toxaphene and 2 pounds DDT

Stauffer BHC E. C.—No. 121
1 gallon contains 1.2 pound gamma BHC

Stauffer BHC-DDT E. C.—No. 9-15
1 gallon contains 0.9 pound gamma BHC and 1.5 pound DDT

Stauffer Chlordane E. C.—No. 602
1 gallon contains 6 pounds Chlordane

Stauffer Aldrin E. C.—No. 203
1 gallon contains 2 pounds Aldrin

Stauffer Aldrin-DDT E. C.—No. 10-20
1 gallon contains 1 pound Aldrin and 2 pounds DDT

Stauffer Dieldrin E. C. No. 151
1 gallon contains 1.5 pound Dieldrin

Stauffer 40% TEPP
1 gallon contains 4 pounds Tetraethyl Pyrophosphate

Stauffer Metacide 50
1 gallon contains 5 pounds active ingredients

STAUFFER CHEMICAL CO.
M & M Building, Houston 2, Texas
WESLACO, TEXAS APOPKA, FLA.

State Guides

(Continued from Page 101)

when the pounds per acre of the actual material remain comparable. Emulsifiable concentrates when mixed with water give an emulsion satisfactory for spraying. The concentrates should be diluted according to the manufacturer's directions, using the recommended pounds of insecticide per acre. The manufacturer's label on the container will give the pounds of technical or actual insecticide contained in a gallon of concentrate.

Sprays may be applied by horse-drawn or tractor mounted low-pressure and low-gallonage sprayers, or by airplane. A nozzle of the hollow cone type should be used and the equipment operated at the manufacturer's specified pressure. Sufficient pressure should be maintained in order to give a good spray pattern. This may vary from 40 to 60 pounds pressure. The amount of spray per acre will vary with the type, and speed of equipment, and number of nozzles per row, but is usually three to nine gallons. For airplane application one to two gallons of spray is satisfactory.

The number of nozzles needed per row for ground equipment will depend on the size of the cotton plant. The following is recommended for seedling cotton—one nozzle per row, for cotton up to 20 inches high—two nozzles, and for plants over 20 inches high—three nozzles. Nozzles should be kept from 8 to 10 inches from the plants to insure a proper spray pattern. For effective coverage, the nozzles should not drag in cotton plants.

Sprays should be applied only when the plants are dry. Applications may be made under condtitions of relatively

strong winds (15 miles per hour). As a safety measure, it is recommended that the spray boom be mounted to the rear of the operator.

It is important to mix emulsifiable concentrates with water before adding to the spray tank. Measure the desired amount of concentrate, add to water in a suitable container, and stir thoroughly. Pour this mixture into the partly filled spray tank and complete filling with water. Agitate the finished spray by pumping back through the over flow into the tank. Thorough mixing is important before the spray operation begins. **Do not add the spray concentrate directly to the tank without previous mixing with water.** The spray equipment should have a pump with an overflow or bypass or mechanical agitator to give continuous agitation during the spray operation. **Do not use insecticides in the form of wettable powders or dusts in low-gallonage and low-pressure cotton sprayers; use only emulsifiable concentrates.**

General

1. A simple way to make infestation counts is to pick at least 100 non-flared squares for each 5 acres as you walk diagonally across a field, picking equally from top, middle, and lower limbs. The number of punctured squares out of each 100 picked is the percent infestation for that count.

2. A heavy dew is not essential for satisfactory dusting conditions, but the air should be calm. Dusting conditions are usually best during the hours from 5:00 P.M. to 9:00 A.M.

Precautions

1. All insecticides used for control of cotton insects are poisonous and should be handled with caution. Read carefully all labels on packages or containers before using any insecticides. Avoid body contact with and inhaling dust or fumes of these materials. **Liquid concentrate insecticides spilled on skin or clothing are extremely dangerous.** If this occurs, immediately remove clothing and bathe thoroughly with plenty of soap and water.

2. Avoid excessive drift of insecticides onto adjacent fields where animals are pastured or where food or feed crops are grown. Most insecticides are also toxic to poultry.

3. Care should be exercised to avoid poisoning honey bees through careless use of insecticides. Nearby beekeepers should be notified before the poison program is begun so that bees may be moved. Dusting at night may reduce bee losses.

4. Insectcides will kill fish if allowed to drift onto or drain from cotton lands into ponds or streams.

5. Special precautions should be taken in handling TEPP and parathion to avoid prolonged contact with the skin or breathing the vapors from either spray or dust.

6. Parathion is highly toxic to human beings. It is poisonous if swallowed, inhaled, or absorbed through the skin. **The precautions printed on the package are for your protection and should be followed carefully.** In applying parathion a respirator should be used to aviod inhaling the material. A dust and vapor type respirator is suggested and may be obtained from the following companies:

American Optical Company, Southbridge, Mass., Chemical Cartridge Respirator, No. R-5055

Mine Safety Appliances Co., Pittsburgh 8, Pa., Chemical Cartrdige Respirator, No. Cr-45779

Wilson Products Company, Reading, Pa., Chemical Cartridge Respirator No. 701

If certain symptoms of illness appear, a doctor should be consulted at once. The antidote (atropine) known to be especially effective in the case of parathion should be carried by those using the chemical, or available for immediate use if needed. See label on containers for symptoms and treatment.

For additional information contact your county agent, vocational agricultural teacher, veterans instructor, or the nearest experiment station.

BARCO

All Formulations
and
All Combinations of
Cotton Poisons

DDT	Aldrin
BHC	Dieldrin
Toxaphene	Parathion
Chlordane	Tepp
Heptachlor	Lindane

BARCO CHEMICALS, Inc.
67 Butner Street
DES MOINES 15, IOWA

1952 Cotton Insect Control Recommendations for:

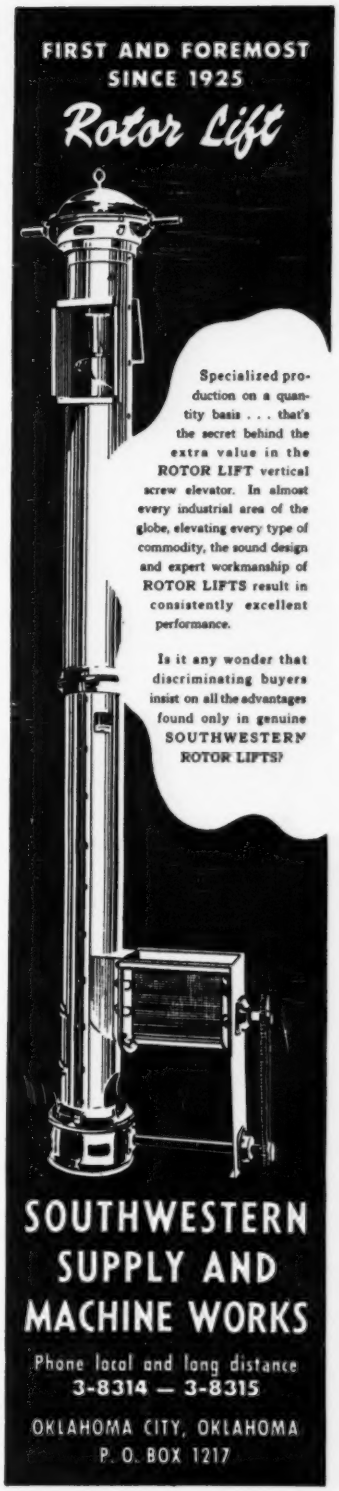
Louisiana

The major cotton pests in Louisiana are the boll weevil, bollworm and cotton aphid (lice). Less important are the spider mites, cotton leafworm, thrips, cotton fleahopper, tarnished plant bug and rapid plant bug. There are several insecticides which will give adequate control of these pests. **The time at which control operations are begun, the interval between applications, the thoroughness of application, and continuing applications as long as needed are more important for successful cotton insect control than the choice of any particular recommended insecticide.**

Boll Weevil

The boll weevil is the number one pest of cotton in Louisiana. Consequently all cotton insect control operations should center around a sound boll weevil control program. This includes infestation counts made at least once a week, beginning

(Continued on Page 109)



THE COTTON INSECT SURVEYS have been worth millions to the farmer. They aid in conserving poisons and getting them to the right places at the right time.

In '52: Save the Bolls - Produce the Bales

Progress of Educational Work in Insect Control

By M. P. JONES

WE HAVE done much in the last few years to develop an educational process that has won wide acceptance of cotton insect control, but the job is still far from finished.

M. P. JONES is Extension Entomologist, Extension Service, U.S. Department of Agriculture, Washington.

THERE HAVE BEEN many changes in cotton insect control since I started with the Federal Extension Service more than 20 years ago. There have been changes in farm practices, development of new insecticides and methods of application by research people, expansion in the number of extension entomologists and improvement in extension programs. The greatest change is in the realization of the importance of insect control by all people who have an interest in cotton production, marketing, and processing.

The educational process is slow. If research and development and the educational work relating to insect control on cotton were left to the handful of entomologists working in the area the great strides that have been made during the past few years could not have been accomplished. Leading cotton growers have helped in the testing of new insecticides and in serving as community leaders. All people in the area associated with industry have made enormous contributions, and educational people in fields other than entomology have placed their shoulders to the wheel to help the entomologists.

The entrance of the boll weevil into the U.S. and the hysteria over the pest during the early 1900's did much to bring about the passage of the act which created the Federal States Cooperative Extension Service. Despite this fact, for many years afterwards only a few of the state Extension Services were able to appoint entomologists on their staffs. By the middle 1930's only five southern state Extension Services employed entomologists on a permanent basis. These men, with the help of the state Experiment Station entomologists and the entomologists with the then Bureau of Entomology, worked with the state and county Extension people in an attempt to effectuate better insect control. They conducted demonstrations, issued press and radio releases, prepared helpful bulletins and various information material. In fact, each state carried out a good educational program and helped many cotton growers in the wise use of insecticides. However, there was a sense of hopelessness among many growers and educational people, about the merits of calcium arsenate as an effective boll weevil poison.

It became obvious that the Extension and research people working alone could not bring about the degree of insect control desired. Other agencies became aware of the situation and during the late 30's the State-wide Cotton Committee of Texas was organized. Their original objectives were: Develop new uses for cotton; improve staple quality and yields of cotton; and secure better ginning. They soon recognized the importance of insects and organized an Insect Control Section. Eugene Butler of Dallas was named chairman and Alston Clapp, Sr. of Houston was named secretary. These men did yeoman service in making the public conscious of the losses occasioned by cotton insects and the need for greater effort in combatting them.

At the Texas Entomological Society Meeting in 1938 the idea of a south-wide cotton insect control campaign was born. This move was to enlist the services of all agencies having to do with cotton production, marketing and processing and solicit their support in an insect control program. It was felt that if the commercial people better understood the need for insect control and practices recommended for the control of the insects they would better support the program.

Also, in 1938 the National Cotton Council of America was organized. Their primary objective was to develop new outlets for cotton. It was not long, however, before a Division of Production and Marketing was established. This division recognized the importance of insect pests in cotton production and immediately began to work with the membership of the Council to enlist their support. They foresaw the need for more research and extension entomologists to work on cotton insect control and worked hard to improve the situation.

In the fall of 1941 there was held in Shreveport, La., a Southwest Conference for Cotton Insect Control. This conference was attended by professional entomologists and representatives of commercial companies, lending agencies and the press, mostly from Arkansas, Louisiana, Oklahoma, and Texas. Formal papers were presented, then the subject matter was further discussed in the four committees that had been formed. Reports were prepared by each committee and adopted by the conference as a

4 GOOD REASONS FOR USING

Carolina JUTE BAGGING

TAKES ROUGH HANDLING

Stands up well under rough handling . . . protects cotton both in storage and during shipment.

LOOKS GOOD LONGER

Open weave admits sunlight and air . . . keeps cotton dry and in good condition. Looks better after cutting sample holes.

EXTRA STRENGTH

Carolina Jute Bagging is extra strong . . . tested for uniformity. Full yardage and full weight is guaranteed.

MAXIMUM PROTECTION

Cotton is subject to less weather damage than that covered with closely woven cloth.

Carolina BAGGING COMPANY

HENDERSON, N. CAROLINA

MANUFACTURERS OF BAGGING AND TIES

whole. Among the nine items in the report of the educational committee was one that asked: "That each state in the Southwest Conference Area employ one or more extension entomologists to work especially on cotton insect control."

The heavy boll weevil infestation of 1941, the confusion associated with the use of calcium arsenate in the southeastern states, and a possible shortage of insecticides because of the war prompted another conference on cotton insect control. Technical workers and administrative people of the U.S. Department of Agriculture and of the Experiment Stations and Extension Services from the southeastern states met in Atlanta, Ga., in January 1942. The whole cotton insect control program was reviewed and several committees were appointed. The first recommendation of the Committee on Extension and Educational Work was that "A trained entomologist be provided in each state to assume leadership in the cotton insect control program." Other recommendations emphasized that more time and emphasis by county agents be placed on cotton production, that cotton insect control be part of a unified cotton program, and that method demonstrations and all teaching tools be developed and used more generally in cotton insect control.

In April 1943 another 4-state meeting was held in Texarkana, Ark., to consider the wartime problems relating to cotton insect control. Other phases of entomology were also covered at this meeting.

As World War II was coming to a close and the new organic insecticides began to come into the picture, the research entomologists felt the need for a coordinated approach to their problems relating to cotton insect control. They started holding meetings at Stoneville, Miss. In 1947 the extension entomologists were invited to participate in these conferences. A rather comprehensive report of the conference was drafted. The report of the conference brought together the results of research, with the new insecticides, for the control of cotton insects. It was designed to serve as a basis for recommendations on cotton insect control to be prepared by the state agencies and the U.S. Department of Agriculture.

The National Cotton Council, realizing the necessity for a coordinated approach to cotton insect control, arranged for an open meeting at Columbia, S. C., in September 1947. To this meeting were invited the public and private agencies having anything to do with cotton production, marketing and processing. The response was so gratifying that a similar open meeting has been held each year since. They have always followed the technical workers' conference. Over 700 people attended the December 1951 meeting held in Memphis, Tenn.

It was especially gratifying to entomologists to see so many people, 90 percent of whom were not entomologists, display so much interest in insect control. It makes us feel that the public is recognizing more than ever the importance of insects in our struggle for existence.

As a part of the Council's Memphis meeting, the educational people reported on their program during 1951 and their plans for 1952. The educational program last year was not materially different from that in 1950 and there is little likelihood that there will be much difference in the 1952 program. There was a shift in emphasis in the 1951 educational program in certain areas due to the lighter boll weevil infestation. Virtually everyone attending the Memphis meeting pledged their support to help reduce the enormous losses caused by cotton insects.

There are many ways in which the different agencies represented at the meeting help; however, it is generally agreed that personal conversation between the cotton grower and the person in whom he has the most confidence will cause him to adopt a practice more readily. Over the years growers have accepted their county agents and specialists as reliable sources for such information. During the past two years a high percentage of the Extension entomologists and county agents in areas where cotton is a major crop devoted the greater portion of their time during the growing season to cotton insect control, in some cases as much as 80 percent. Granting that personal interviews is the best educational means, the impossibility of adequate service to each grower by personal interviews becomes apparent when we consider that there is only one county agent to almost 1500 growers. This situation emphasizes the need for Extension people to work closely with other informational and service agencies in conveying the findings of research to the cotton grower.

Within the last few years the states and counties have organized to most effectively meet their local situations. The kind of organization varied with the states but all attempted to bring everyone interested in cotton production into the insect control program.

The excellent program developed in South Carolina is a good example of how the work was organized. The agencies concerned with cotton production organized a state committee. Their counterparts also organized county committees. The program for the year was printed and each cooperator was provided with a copy. This program spelled out the responsibility of each cooperator so that each person not only knew his assignment but that of each other cooperator.

Although the other states printed no similar formal program, good working relations were maintained and the functions of the various agencies were understood by all. Most of the programs were within the framework of the 7-Step Cotton Program, although they may not have been recognized by that name. The 7-Step Program was a complete cotton production program which was beamed towards cotton insect control during these critical years of insect damage.

In general the programs within the states and counties were organized and carried out in somewhat the following manner:

Following the technical workers' conference and the open cotton insect control conference in Memphis last year the state people developed their educational program. Specific recommendations for the major insects were drafted by the people in each state. These were discussed with the Extension workers in the counties either in district or county meetings. These meetings were often followed with open meetings on a county and community basis. Color slides and motion pictures were used to help familiarize the public with the different cotton insects and their damage, also to illustrate the various control measures. Charts, maps, and other illustrative material were also used to help growers better visualize their problems, and how best to solve them. Growers were urged to procure at least a part of their insecticides at the time they purchased their seed and fertilizer. This was to insure having some on hand when first needed, also to insure against a possible shortage at some critical period. The press, radio, and in some cases television, were used to keep current information before the cotton grower and the public in general. Newspapers and magazines gave generously of prominent space to carry the message on insects and their control. Some printed special cotton insect editions. Radio stations allotted much time for the agents and specialists to voice their information. This up-to-the-minute means of communication was all the more necessary because of the uncertain insect and insecticide supply situation. Most of the states issued weekly and special circular letters to county agents and other interested parties. These letters carried timely information on the cotton insect siutation and pertinent information on control. The Beltwide situation was given in a weekly survey report from the Bureau of Entomology and Plant Quarantine, Division of Cotton Insect Investigations.

The new organic insecticides have changed the situation somewhat. They provide control measures for certain early season pests for which no practical contorl measure were available a few years ago. Improper use of these chemicals may lead to a build-up of other cotton pests such as mites, aphids, and bollworms.

Some of the entomologists who were about to recommend regular annual schedules for boll weevil control now feel that control must be based on needs as shown by survey results.

The most effective surveys are those properly made on each cotton field or portions of larger fields. Some Extension entomologists report remarkable progress in the number of cotton growers making surveys as a requisite to the application of insecticides. Further work with such growers will be to help them perfect their methods of making surveys and in interpreting their survey results in terms of the need for applying control measures for the particular insect pest. It appears that a higher percentage

Quotes From Our Authors:

"GINNERS ARE in a position to perform two of the most essential jobs on which the entire (insect control) educational activity hinges—first, convincing the individual farmer of the value of insect control and, second, encouraging producers to follow systematically the cotton pest control recommendations of their state entomologists."

of farmers made their own surveys in the states where this program has been stressed over a period of years and where extra entomological help has been employed to help growers perfect their surveys. For example, in 12 counties in Arkansas scouts were employed to help the county agents and farmers with scouting. These scouts were employed in different ways. Some were employed cooperatively by groups of farmers, some by commercial interests in the area. There is a case in Louisiana where a company contracts acreage of cotton to be surveyed. It employs and trains scouts to survey the acreage under contract. Best results are obtained when there is proper supervision of the scouts until they are thoroughly familiar with their work and are able to interpret their findings. Reports indicate that additional scouts would have been employed, in certain areas last year, if suitable men would have been available. In some areas farmers are doing their own scouting as a result of their employing scouts a few years ago. They found by working with the scouts that the practice was not as difficult as they originally thought.

All of the major cotton-producing states employ one or more entomology specialists. Alabama, Arkansas, Georgia, Louisiana, Mississippi, and Tennessee each have one full-time Extension entomologist. This applies also to California, Arizona, and New Mexico. Two states, Oklahoma and North Carolina, each have two and South Carolina three. Texas has five full-time men with a third of the time of the head of the Department of Entomology. Two of these Extension entomologists are located at the Agricultural and Mechanical College and three are located elsewhere in the state: One at Weslaco, one at Lubbock, and one at Vernon. Extension entomologists with the aid of seasonal help and with specialists in other phases of cotton production have placed cotton insect control on a much sounder basis than was the case a few years ago.

More and more growers are following recommendations for spraying or dusting based on up-to-the-minute reports of insect abundance. They are finding it a profitable practice. Other growers, however, still fail to follow recommendations. Many still apply insecticides when they are not necessary. Some growers were so well pleased with the results in 1950 that they followed the same regular schedule in 1951, without determining their insect population. Other growers suffered such severe losses in 1950 that they felt impelled to apply insecticides in 1951 regardless of whether or not they were needed. In either case the growers lost faith in the value of insecticides when the results were less than expected or no better than those of a neighbor who used a less intensive insect control program, or perhaps none at all. As long as these situations prevail we cannot become complacent. Our education job is far from finished.

The 1952 cotton insect control program will consist of attempting to help growers put control measures in gear with cotton insect populations, helping them to perfect methods of scouting, and interpreting their data in terms of necessary control measures. We should eventually reduce the enormous losses caused by cotton insects with continued wholehearted help and cooperation from all agencies interested in cotton production.

State Guides

(Continued from Page 105)

when the plants start squaring, and applying insecticides where and when needed.

• **Early Season Control**—Poisoning for the control of overwintered boll weevils seldom, if ever, is profitable under Louisiana conditions and is not recommended as a general practice.

Where heavy populations of overwintered boll weevils do occur, which is usually near favorable hibernation quarters, such as wooded areas, waste lands, and buildings, 2 or 3 applications of a recommended poison may be made. Treat only the area that is heavily infested.

The applications should be started as soon as the cotton starts squaring and made 7 to 10 days apart. Apply from ½ to ¾ the amount recommended for later applications. (See tables for control recommendations.)

• **Mid-Season Control**—Begin treatment when 25% of the squares have been punctured by boll weevils. Make applications at 4- or 5-day intervals. **Treat only those areas of the field where the infestation counts show control is needed.** Don't start general treatment until the plants average at least 3 half-grown or larger squares per plant and infestation counts show treatment is needed. (See tables for control recommendations.)

• **Late-Season Control**—After migration of boll weevils starts, usually about the middle of July in central Louisiana and

(Continued on Page 113)

Sell Quality

CHAPMAN™

AGRICULTURAL CHEMICALS

Insecticides

Toxaphene	Dieldrin	Tobacco Dust
Gamma BHC	DDT	Tomato Dust
Aldrin	Chlordane	Strawberry Dust

Weed and Grass Killers

WEED-FREE	2,4,5-T LV
2,4-D Amine-40	Penta Weed Killer
2,4-D Ester-40	Polybor-Chlorate 88
Brush Killer	Borascu

Defoliant

Golden Harvest—a Pentachlorophenol Concentrate

For literature and prices, write:

AGRICULTURAL DIVISION

CHAPMAN CHEMICAL COMPANY

Dermon Building • Memphis 3, Tenn.

SPRAYING for insect control by airplane is effective and economical on larger acreages, but it is a method of application that calls for close supervision.

In '52: Save the Bolls – Produce the Bales

Pest Control Research Costs and Results

By L. S. HITCHNER

■ SURVEYS SHOW that it costs from $165,500 to $355,000 to develop a new pesticide, and that 22 manufacturers spend nearly $600,000 a year for research on cotton pests.

ONE PHASE in the drive to increase cotton yields which has not been exploited to its full potentiality is the business of increasing net yields by better control of insects, diseases and weeds.

Over 29 million acres of cotton were under cultivation during the 1951 crop season; yet less than 16 million bales of cotton were harvested. Many factors influenced the yield, but insect, diseases and weeds made terrific inroads into the net returns.

Insect Losses

Throughout the Cotton Belt, insects alone destroy nearly one bale out of every four that represent a full yield. Based on today's markets, in terms of dollars, this represents about a half billion dollar annual gross loss to the grower. Any loss factor which represents one-fourth of the yield of any crop certainly should be critically examined when efforts are made to increase yields. In such states as Missouri, New Mexico, Arizona and California, where boll weevil damage is not a problem, losses from insects amount to less than 10 percent and there is not a great opportunity for overall improvement in net yields. But many of the states which have a boll weevil problem now have losses ranging from 20 to 65 percent from all insects. In these states, where the bulk of the cotton is produced, an intensified insect control program reducing losses by only 10 percent would add over 380,000 bales of marketable cotton for an additional return of 76 million dollars. Reducing cotton losses from insects by 10 percent is well within a possibility with today's agricultural chemicals.

L. S. HITCHNER is Executive Secretary, National Agricultural Chemicals Association, Washington.

Conservation

In terms of land utilization, the entire U.S. production of cotton could be grown on three-fourths of the acreage now planted, if losses due to insects were entirely eliminated. This would make over seven million more acres of land available. No doubt, cotton production without some insect damage is an unattainable utopia; but losses of 25 percent present a very inviting region for the application of efficiency—regardless of the type of operation under consideration.

Diseases and Weeds

In addition to insects, there are diseases and weeds which take their annual toll of cotton production by cutting down yields. Losses from these agents are difficult to estimate under the most controlled conditions, but recently discovered chemicals are very promising additions to a program of increasing cotton yields. An intensified insect control program **plus** improved control of weeds and diseases by use of chemicals have a potential not yet fully explored.

Role of Industry

Agricultural chemicals already play a large part in increasing cotton yields through control of pests; but the industry recognizes from their experience in other phases of crop pest control, that there is a wide margin of improvement left open in control of cotton pests. For this reason, manufacturers are expending increasingly larger sums for research and development of new and better products and improved methods of application. Cotton producers have taken advantage of recent progress in agricultural chemicals, but not so well known is the huge investment in research and development that such progress entails. With few exceptions, the recently introduced pesticides have come from industrial laboratories, operating under the same rising costs which have affected other businesses.

Investments in Research

As to the average cost of research and development of a pesticide, Dr. C. O. Persing of The Stauffer Chemical Company presented some eye-opening figures at a recent Washington, D. C. meeting of the Association of Economic Poisons Controls Officials.

Dr. Persing informed the group that according to a survey he made, the costs of development of a pesticide varies with the type of chemical involved, and presented the following figures as ranges in costs:

Attorney's fees	$ 500—	$ 5,000
Field Studies (all charges)	50,000—	50,000
Toxicity Studies	20,000—	30,000
Analytical Methods	10,000—	10,000
Production Research & Pilot Plant Construction	75,000—	250,000
Administration	10,000—	10,000
Total	$165,500—	$355,000

The range of $165,500 to $355,000 to

PROTECT YOUR COTTON WITH "Black Leaf®" INSECTICIDES

BLACK LEAF DUST FORMULATIONS

3-5-0
(BHC and DDT)

3-10-0
(BHC and DDT)

3-5-40
(BHC, DDT and Sulphur)

3-10-40
(BHC, DDT and Sulphur)

20-0
(Toxaphene)

20-40
(Toxaphene and Sulphur)

2½-0-0
(Aldrin)

2½-5-0
(Aldrin and DDT)

2½-10-0
(Aldrin and DDT)

2½-5-40
(Aldrin, DDT and Sulphur)

2½-10-40
(Aldrin, DDT and Sulphur)

5% DDT Dust

10% DDT Dust

NICOTINE Dust

Calcium Arsenate

Calcium Arsenate with Nicotine

•

BLACK LEAF SPRAY CONCENTRATES

TOXAPHENE Emulsions

DDT Emulsion

ALDRIN Emulsion

DIELDRIN Emulsion

•

VAPO-FUME® 40

(40% Tetraethyl Pyrophosphate for dusting or spraying)

Enlarged photo of boll weevil.

Your best protection against the weevil and other insects which attack cotton is a reliable, dependable insecticide. Make your choice from the complete line of Black Leaf® Cotton Insecticides listed at left.

Produced at Montgomery, Ala., and Waco, Texas, and stocked in warehouses conveniently located throughout the cotton belt, these Black Leaf Dusts and Sprays are the result of years of experience in the manufacture of high-quality insecticides.

Black Leaf Dust Formulations are manufactured to the *right* particle size. They do not float too long in the air nor drop too quickly to the ground. They settle and stick on the cotton plant, covering leaf and square with maximum protection.

Black Leaf Spray Concentrates mix easily with water for efficient, economical use. They contain stable materials which insure against breakdown and separation.

Black Leaf Cotton Insecticides are packed for easy handling ...Dust Formulations in multiwall bags...and Spray Concentrates in 5, 30 and 50-gallon drums. Use Black Leaf Cotton Insecticides and follow application schedules recommended by your local authorities.

TOBACCO BY-PRODUCTS & CHEMICAL CORPORATION
Montgomery, Ala. • Waco, Texas • Richmond, Va.

develop a product represents the extremes, while the average cost to a company varied from $255,000 to $350,000, Dr. Persing reported.

He said his survey disclosed that one company spent $1,350,000 in the development of one product; while another company spent $150,000 without being able to market their product.

Persing pointed out that after the initial research and development is completed, the cost of a pilot plant and a full production plant must be added before the product can be marketed in quantity. According to the survey, one company invested $400,000 and their sole productive capacity for the product is the amount produced by their pilot plant.

Dr. Persing told the officials that a product must have a marketing expectancy of five years before the cost of development can be risked. He stated that during the last two years of this period, if the initial investment is realized, new competitive products and the build-up of pest resistance to the chemical are factors which greatly influence the consumer acceptance of a product during the period when the sale of the product might be profitable to the company.

Recently, the National Agricultural Chemicals Association made an inquiry into the amount of research being conducted for improved methods of cotton insect control. Of 28 companies reporting, 22 spend nearly $600,000 yearly in research just for cotton pests. These 22 companies had 38 state projects and 46 company projects in force during 1951. These figures represent only a sector of the industry doing research on cotton insect control and they do not include funds for research in weed control and defoliation of cotton which have received great impetus in the past few years. We do not know how much is being spent to develop products for defoliation and weed control studies in cotton, but it may equal or exceed that expended for research in insect control.

The $600,000 annual expense for research in cotton insect control is a large slice of an estimated eight million dollar annual research cost borne by the agricultural chemicals industry in the search for, and development of pesticides in all phases of crop production.

Grower Benefits

Not only new chemicals, but better methods of application of new and old products arise from research programs. The relatively new practice of using a "preventive" instead of a "cure" pest control program in some cotton producing areas grew out of the adatability of the organic chemicals to liquid formulations. New machines which deliver a small volume of spray per acre also grew out of these new formulations. But regardless of the method used in application, a wide choice of chemicals (both organic and inorganic) is now available and that choice will continue to grow. In periods of shortages, it is essential that cotton pest control chemicals be manufactured from many different basic raw materials, if we are to have an adequate quantity of materials constantly ready.

The availability, effectiveness and adaptability of cotton pest control products should bring about an intensified effort to recover that one bale out of four lost to insects. With the agricultural chemicals industry investing more and more money in better chemicals and methods, there is a real opportunity to whittle down that 25 percent loss during the next few years and bolster the overall yield of cotton. This is especially true since farm leaders and the growers, themselves, are enthusiastically promoting this program.

Quotes From Our Authors:

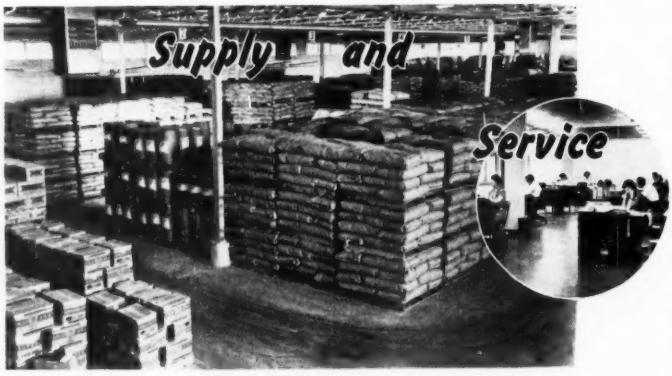
"AN OVERALL picture of prospective insect pest conditions is provided by general surveys conducted cooperatively by federal and state entomologists, but the farmer himself must learn to interpret reports of these surveys by reading signs of insect buildup in his own cotton fields."

Pakistan and Italy Make 1952 Trade Agreement

A recent trade and payments agreement between Italy and Pakistan which became effective Jan. 1 provides, among other items, for the shipment of about 230,000 bales of cotton (of 500 pounds gross) from Pakistan to Italy during the 1952 calendar year.

Call on Van Waters & Rogers, Inc. *for:*

Cotton Dusts and Sprays ★ Agricultural Insecticides ★ Weed Killers



ORDER TODAY!

FROM

VAN WATERS & ROGERS, INC.

10216 Denton Road — P. O. Box 1188

Telephone DIxon 7561 — Dallas, Texas

Represented in Memphis, Tenn., by **W. C. MANLEY,** Falls Building, Memphis, Tenn.

VANROG COTTON INSECTICIDES

The following formulations are manufactured according to our high standards and carry the quality VANROG label.

3-5-40 Dust — contains 3% Gamma BHC, 5% DDT, 40% Sulphur.

3-5-0 Dust — contains 3% Gamma BHC, 5% DDT, Inerts.

2-10-40 — contains 2% Gamma BHC, 10% DDT, 40% Sulphur.

3-10-40 — contains 3% Gamma BHC, 10% DDT, 40% Sulphur.

6 lb. Toxaphene Emulsion.

8-lb. Toxaphene Emulsion.

4-2 Toxaphene DDT Emulsion contains 4 lbs. Toxaphene, 2 lbs. DDT per gallon.

Combination All-Purpose Spray—contains Emulsion BHC-DDT.

Aldrin 2—contains 2 lbs. Aldrin per gallon.

Dieldrin Emulsion.

Calcium Arsenate.

We also handle a complete line of Agricultural Chemicals and Insecticides for the farm!

State Guides

(Continued from Page 109)

about August 1 in north Louisiana, make insecticide applications 4 to 5 days apart until the crop is safe—when youngest bolls which are expected to be harvested are 3 weeks old. (See tables for control recommendations.)

Bollworms

The bollworms are second to the boll weevil in importance as cotton pests. Although they may be present on cotton anytime after fruiting begins, damaging infestations usually do not occur until about the middle of July. Infestations are likely to be more severe following applications of insecticides for control of other pests because of the destruction of beneficial insects which feed on the eggs and small bollworms. Applications should begin when eggs and 4 or 5 small bollworms per 100 plant tips are found. Counts should be made at weekly intervals to determine when control measures are needed. It is especially important to apply insecticides before the small bollworms have begun feeding on squares and small bolls. Thorough coverage of terminal growth is essential for successful control. (See tables for control recommendations.)

Aphids

Damage by the cotton aphid often occurs following the use of insecticides for control of other pests. Aphids are usually found on the underside of the leaves and in the tips of the plants. Infestations are indicated by curling and twisting of the leaves and by the presence of honeydew on the upper surface of the leaves. Applications should begin as soon as honeydew is noticed on the plants. (See tables for control recommendations.)

Spider Mites

Spider mites often occur in destructive numbers on cotton. Like the cotton aphid they are found on the underside of the leaves. The tiny mites are so small that careful examination is necessary to detect their presence. Infestations usually develop around margins of fields, near ditch banks, roads and house sites. Damage by spider mites is usually associated with the application of insecticides for the control of other pests. (See tables for control recommendations.)

Cotton Leafworm

The cotton leafworm damages cotton by destroying the foliage before the crop is mature. (See tables for control recommendations.)

Thrips

Nearly every field of cotton is infested in the seedling stage by thrips. These small, elongated, yellow or dark-brown insects attack the seedling plants as soon as they are out of the ground. Their injury causes a ragging and crinkling of the leaves, retards growth, and may damage the stand. Cotton outgrows this injury, and there is usually little effect on yield. Thrips control may be justified because it allows the plants to grow off more rapidly and uniformly. This aids in cultivation and may result in a little earlier maturity. Applications of insecticides for thrips control destroy many of the beneficial insects and often result in the build-up of damaging infestations of spider mites, bollworms and the cotton aphid. (See tables for control recommendations.)

Cotton Fleahopper

The cotton fleahopper may cause injury to cotton by blasting small squares. Damage in localized areas may be sufficient to require control measures. (See tables for control recommendations.)

Tarnished Plant Bug and Rapid Plant Bug

The tarnished plant bug and rapid plant bug often cause injury to cotton by blasting the squares, including those nearly ready to open. The dust (except calcium arsenate) and spray mixtures recommended for boll weevil control will control these pests.

Insecticide Formulations

Insecticides for cotton insect control are sold as dust and spray formulations. Dusts are mixed and bagged at the plant and are delivered ready to use. It is not advisable to attempt home-mixing of dusts. Sprays for cotton insect control are prepared as emulsifiable concentrates. Water must be added before they are ready to be applied. It is always advisable to test an emulsifiable concentrate before applying the spray to be sure it forms a good emulsion when the water is added.

Insecticides Recommended for Controlling Cotton Insects in 1952

Calcium Arsenate is an economical and effective insecticide for the control of the boll weevil and cotton leafworm. When it is used without an aphicide, an

(Continued on Page 117)

Louisiana's Recommendations for Insect Control

SPRAYS

Insect	Insecticide	Pounds of Technical Insecticide Per Acre
Boll weevil	Toxaphene	2 - 3
or	Aldrin—DDT	.25 aldrin + .5 DDT
Boll weevil	Dieldrin—DDT	.15 dieldrin + .5 DDT
and bollworms	Heptachlor—DDT	.25 heptachlor + .5 DDT
	BHC (gamma isomer)—DDT	.3 g BHC + .5 DDT*
Bollworms	Toxaphene—DDT	2 Toxaphene + .5 DDT
	DDT	1
Cotton leafworm	Toxaphene	2
	BHC-DDT	.3 g BHC + .5 DDT
Cotton fleahopper	Same as for boll weevil	½ to ¾ of that required for boll weevil control
Thrips	Aldrin, dieldrin, heptachlor, toxaphene, BHC or any of the mixtures recommended for boll weevil control	Half the amount recommended for boll weevil control
Spider mites	TEPP	½ pint of 40% per acre or its equivalent
	Aramite	.6
Cotton aphid	TEPP	½ pint of 40% per acre or its equivalent
	BHC (gamma isomer)—DDT	.3 g BHC — .5 DDT.

*Some formulations of .3 lb. of g BHC + .5 lb. DDT have caused plant injury.

DUSTS

Insect	Insecticide	Lbs. Per Acre	Time to Treat	Intervals Between Applications
Boll weevil	A. BHC-DDT-sulphur, 3-5-40	10-15	When 25% of squares have	4 or 5 days
or	Alternated with calcium arsenate	7-10	been punctured by boll wee-	Same
Boll weevil,	B. BHC-DDT-sulphur, 3-5-40	10-15	vils (see discussion for over-	Same
bollworms and	C. Toxaphene-sulphur, 20-40	10-15	wintered boll weevils)	Same
spider mites	D. Aldrin-DDT-sulphur, 2½-5-40	10-15		Same
	E. Dieldrin-DDT-sulphur, 1½-5-40	10-15		Same
	F. Heptachlor-DDT-sulphur, 2½-5-40	10-15		Same
Bollworms	A. DDT, 10%	10-15	When eggs and 4 or 5 small bollworms per 100 plant tips are found present	5 days
Cotton leafworm	A. Calcium arsenate	10	When leafworms appear	When needed
	B. Toxaphene-sulphur, 20-40	10	Same	Same
	C. BHC-DDT-sulphur, 3-5-40	10	Same	Same
Cotton fleahopper	Same as for boll weevil	7-10	When 25 fleahoppers per 100 plant tips are found	7-10 days
Spider mites	A. Sulphur	20-25	When mites appear	4 or 5 days
	B. Parathion, 1%	15	Same	Same
Cotton aphid	A. BHC-DDT-sulphur, 3-5-40	10-15	When honeydew appears	When needed
	B. Parathion, 1%	10-15		for "knockout"
	C. Nicotine, 3%	10-15		
Thrips	Aldrin, dieldrin, heptachlor, toxaphene, BHC or any of the mixtures recommended for boll weevil control	5-6	As soon as cotton is up to a stand	7-10 days

In '52: Save the Bolls - Produce the Bales

Progress of Cotton Insect Control In the Southwest

By K. P. EWING

A FARMER can control cotton insects on his own field or farm, the author says, but if his neighbors join in the fight, control is usually more effective and less expensive.

MORE PROGRESS was made in controlling the major cotton insects during the last five or six years than during all previous years. Agricultural leaders give much of the credit for increased cotton yields in Texas to improved insect control. Entomologists have worked hard to develop a control program that is practical, economical, and can be used successfully by the average cotton grower. Although a complete job is not yet being done, far more cotton growers are making a success of insect control than ever before. Some of the outstanding developments that have probably contributed to this progress in the Southwest will be briefly discussed.

New Insecticides

Prior to 1947 calcium arsenate was the principal insecticide used against cotton insects. Throughout the Cotton Belt only about 2,500,000 acres of cotton were treated annually with calcium arsenate, and a large proportion of this acreage, probably 50 percent or more, was treated for control of the cotton leafworm. Not more than 10 percent of the cotton acreage in the boll weevil states was receiving insecticide treatment for weevils prior to 1947 or 1948, when the new synthetic insecticides came into general use. An entirely new picture presents itself now.

Through questionnaires sent to each county, extension entomologists in Texas have compiled data on the amounts of various insecticides used each year for which figures were available from 1941 to 1951. From these data the total amount of insecticide and the percentage of each kind have been estimated, as shown in Table 1. Through the courtesy of the extension entomologist of Oklahoma similar records for that state are available for the years 1947 to 1951. These records are shown in Table 2.

The over-all rapid change from the old to the new insecticides is shown in the accompanying chart. Leafworm infestations were heavy and widespread in 1941, 1942, and 1950, and a large percentage of the arsenicals used in those years was for the control of this insect. Limited numbers of leafworms were present in localized areas in 1943 and 1946, but few in other years. In the chart, the quantities of spray materials have been converted to equivalent amounts of dusts on a per-acre coverage basis in order to show true comparisons and to give an idea of total amounts of insecticides used on cotton in Texas in recent years.

Note the rapid increase in the use of sprays. The ratios of sprays to dusts were approximately as follows: In 1949, the first year sprays were used by farmers, 1 to 38; in 1950, 1.4 to 1; and in 1951, 6 to 1.

New Method of Application

The development of emulsion concentrates and low-pressure, low-gallonage machines for applying them brought about a new approach to the insect-control problem. This new method of application fits nicely into the early-season control program. In the last two years probably 80 percent or more of the sprays used on cotton in Texas have been for early-season control. Without satisfactory ground spray machines this program would not be a success in this state, where winds blow much of the time and it is practically impossible to get dusts to stick on small cotton plants. Not only are sprays more effective on small cotton, but they are more economical. Moreover, with sprays farmers can maintain regular daylight schedules of applications, which have been impossible with dusts.

Early-Season Insect Control

In Texas much progress has been made through the control of early-season insects. These insects, especially thrips, often delay growth and fruiting of cotton plants for two or three weeks. This delay leaves the cotton vulnerable to a longer period of attack by late-season insects, with consequent loss of yield or an expensive fight to produce the crop. Other late-season hazards that often reduce yields are extreme droughts or prolonged rainy spells. The largest profits usually result from the production of an early cotton crop.

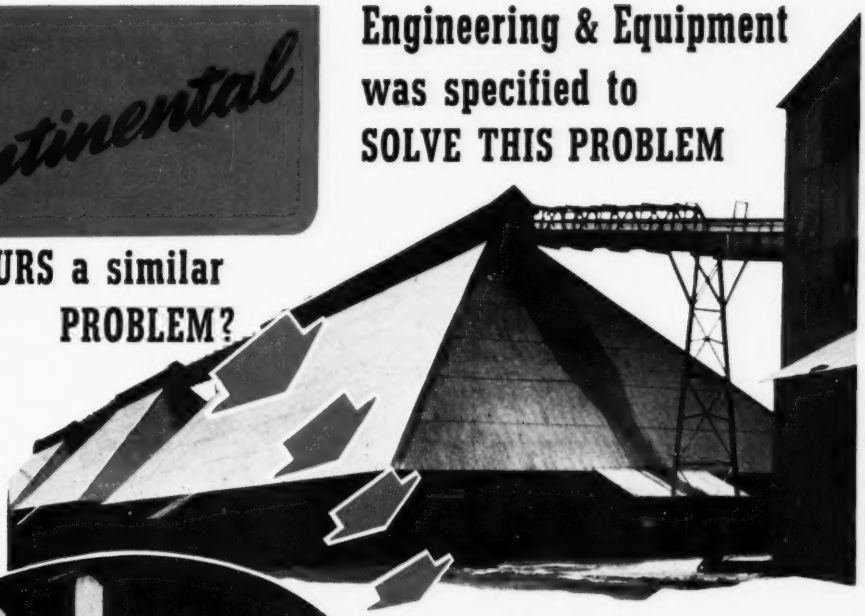
It should be emphasized that early-season insect control is not the same as presquare boll weevil control, although the former often includes the latter. Presquare boll weevil control was advocated by some people and practiced to a limited extent in certain areas for many years when calcium arsenate was the chief insecticide. Calcium arsenate, either as a dust or in sweetened mixtures, would kill the boll weevil, but it would not control other injurious early-season insects. In fact, increased infestations of aphids often followed its use. When the new all-purpose insecti-

K. P. EWING is Entomologist, U.S. Department of Agriculture, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, Waco, Texas.

Continental

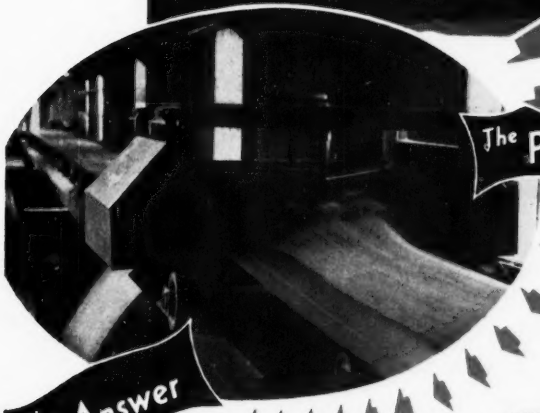
Engineering & Equipment was specified to SOLVE THIS PROBLEM

Is YOURS a similar PROBLEM?



The Problem

To convey seed at the rate of 100 tons per hour from the cleaning room, discharging at any point in any one of the three storage houses. The total length of the system was over 700 feet. Low headroom in the storage house galleries prohibited the use of trippers.



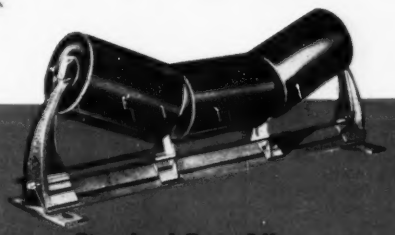
The Answer

Continental Engineers solved the problem with a system of 30" flat belt conveyors traveling at 450 feet per minute.

Traveling plows with adjustable blades discharge the seed at any point in any storage house.

This simple but effective solution of a materials handling problem is another example of how Continental is meeting the problems of all industry. Whether it be for seed mills, textile mills, feed mills, quarries, coal mines, power plants—whatever the problem—whatever the industry—Continental will show the way.

CG-5007



Standard Duty Idler

We have the idler for your particular purpose. Write us today for our Catalog ID-481-A, "Continental Belt Conveyors."

Specify CONTINENTAL

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS

Table 1.—Insecticides used on cotton in Texas 1941-51

MATERIALS	1941	1942	1943	1946	1947	1948	1949	1950	1951
					DUSTS				
Total (million pounds)	46.6	45.2	14.2	19.6	31.0	31.4	49.8	95.8	53.8
Percent of Total:									
Calcium arsenate	71.8	68.3	60.5	57.7	22.2	6.2	2.0	10.6	4.0
Lead arsenate	4.1	5.6	2.8	1.8	0.3	—	—	—	—
Paris green, lead arsenate	1.2	2.8	1.4	0.5	0.4	—	—	0.8	—
Cryolite	0.6	0.4	0.7	0.6	0.08	—	—	—	—
Nicotine sulfate	—	0.5	0.4	0.2	0.02	—	—	—	—
Sulfur	22.3	22.4	34.2	18.0	42.5	18.1	7.7	17.9	5.0
DDT 5 and 10%	—	—	—	21.1	32.0	34.7	35.6	13.1	18.8
3-5-40	—	—	—	0.1	2.0	22.7	33.6	33.8	44.2
Toxaphene 20%	—	—	—	—	0.5	17.0	20.6	22.7	14.5
Aldrin 2.5%	—	—	—	—	—	—	—	0.3	2.8
Parathion 1%	—	—	—	—	—	—	—	0.1	2.8
2-10-30 and others	—	—	—	—	—	1.3	0.5	0.7	9.4
					SPRAYS				
Total emulsion concentrate (million gallons)	—	—	—	—	—	—	0.03	3.3	8.6
Percent of Total:									
Toxaphene 60 and 80%	—	—	—	—	—	—	100.0	47.6	46.8
Toxaphene DDT (2-1)	—	—	—	—	—	—	—	41.4	34.0
DDT 25%	—	—	—	—	—	—	—	4.7	13.8
Aldrin	—	—	—	—	—	—	—	4.5	3.6
TEPP	—	—	—	—	—	—	—	0.4	1.0
Parathion	—	—	—	—	—	—	—	0.1	0.8
Chlordane-DDT	—	—	—	—	—	—	—	0.7	—
Chlordane	—	—	—	—	—	—	—	0.6	—

cides became available, the early-season control program was developed. In areas where the boll weevil thrives, early-season control should certainly be designed to kill as many overwintered weevils as timing of the insecticide applications will allow, but presquare weevil control is not by any means the sole object of this program. Many times and in many areas the chief advantage is in killing other injurious insects, especially thrips.

In Texas early-season applications of insecticides are recommended in all areas where thrips, aphids, fleahoppers, or boll weevils, alone or in combination, cause damage every year.

Proper timing of the early-season applications is very important. Often it is just as important to know when to stop the applications as when to start them. This subject is discussed in the Guide for Controlling Cotton Insects in Texas in 1952, which appears elsewhere in this magazine. The late-season program is also discussed.

Community Action

A farmer can control cotton insects on his own field or farm, but if his neighbors join in the fight the control is usually more effective and less expensive. This is particularly true with such migratory insects as the boll weevil. After all, the cotton grower wants to control his insects in the easiest, surest, and least expensive way. Cotton farmers in many sections of Texas have already learned through experience that this means at least two things—early-season control and community action. In the southern areas early-fall destruction of cotton stalks on a community-wide, or even on an area-wide, basis is also important in controlling certain insects.

In 1948, 1949, and 1950 several experiments on community control of cotton insects were conducted by the Waco, Texas, laboratory of the Bureau of Entomology and Plant Quarantine. Results of these experiments have been published in this and other magazines of the Southwest. In 1951 many successful community-wide control projects were conducted in various sections of Texas. In central and north-central Texas the community action on early-season insect control was so widespread that in some counties it was hard to find untreated fields.

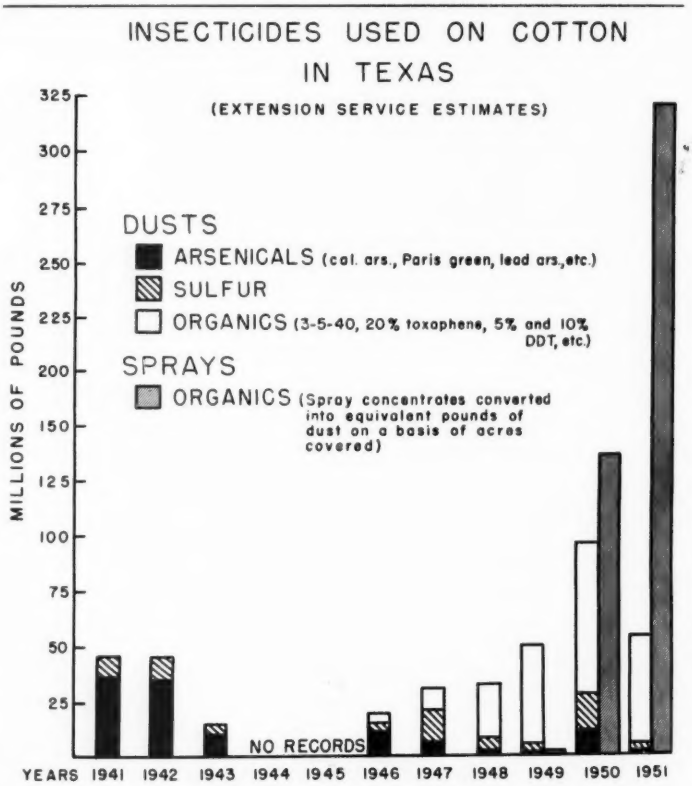
Cotton-Insect Surveys

Since 1943 cotton-insect surveys have been conducted in Texas, Oklahoma, and some of the other cotton-growing states. The purpose of these surveys is to help growers increase their yields of cotton by preventing losses caused by insects. Many agencies and individuals throughout Texas and Oklahoma cooperate in these surveys. Spot checks of insect conditions are made at weekly intervals in many cotton-growing areas. These checks are often extensive enough to serve as timely guides to farmers over large areas.

Two examples of beneficial results of the survey in 1951 will be cited.

Early in the season the survey records showed practically no injurious infestations of thrips, boll weevils, or other insects on cotton in the Coastal Bend (Corpus Christi) area, which included close to a million acres. Farmers were notified of this situation, and therefore used very little poison in that area.

On the other hand, spot checks in central, north-central, northeast, and east Texas, representing 44 counties and 3½ million acres of cotton, showed a high percentage of fields with damaging infestations of thrips and high populations of overwintered boll weevils. Upon receiving this information farmers undertook an extensive early-season control program. Eighty percent of the fields in these areas were poisoned, most of them early in the season. In some counties in central Texas more than 90 percent of the fields were poisoned. The seasonal average boll weevil infestation in the poisoned fields was less than half that in the unpoisoned fields. At the end of the season the average had reached only 27 percent of punctured squares in the poisoned and 57 percent in the unpoisoned fields. The early poisoning also reduced the high infestation of



Comparison of amounts of various insecticides used on cotton in Texas 1941 to 1951. Compiled from estimates furnished by Extension Service.

Table 2.—Insecticides used on cotton in Oklahoma 1947-51

Materials	1947	1948	1949	1950	1951
			DUSTS		
Total (million pounds)	2.0	2.0	3.9	10.6	5.7
Percent of total:					
Calcium arsenate	74.7	16.8	1.8	6.64	0.5
Paris green	0.1	0.1	0.1	0.05	—
Cal-Green	3.4	0.8	0.2	0.4	—
Sulfur	19.9	5.3	1.7	—	—
DDT	1.4	9.4	9.1	—	—
BHC	0.1	1.2	—	—	—
3-5-40	0.1	55.1	69.0	48.8	72.4
Chlordane-DDT	0.3	1.6	1.1	—	—
Toxaphene	—	9.7	17.0	25.2	12.8
3-10-40	—	—	—	4.4	12.9
Toxaphene-DDT	—	—	—	9.6	—
Aldrin	—	—	—	1.1	0.59
Aldrin-DDT	—	—	—	2.8	—
Chlordane	—	—	—	0.2	0.01
Parathion	—	—	—	0.01	—
Others	—	—	—	0.8	0.8
			SPRAYS		
Total emulsion concentrate (million gallons)	—	—	—	—	0.7
Percent of total:					
Toxaphene-DDT	—	—	—	—	46.9
Toxaphene	—	—	—	—	27.8
DDT 25%	—	—	—	—	17.1
Aldrin	—	—	—	—	1.2
Aldrin-DDT	—	—	—	—	6.9
Parathion	—	—	—	—	0.1

thrips and accelerated plant growth and early fruiting. Later where the extreme drouth checked the fruiting the cotton that had been poisoned had the most grown or near-grown bolls and produced the highest yield.

Cultural Practices

Farmers of the Southwest are using more cultural or good farming practices than ever before. More and better farm machinery makes this possible. All these practices help increase yields, and several have a direct bearing on insect control.

One important cultural practice in certain areas of Texas, especially in the southern portion is the plowing under of cotton stalks immediately after harvest while the stalks are still green. This worthwhile farm practice increases the fertility of the soil and also helps to reduce insect populations for the next season, particularly boll weevils and pink bollworms. Through the planting of earlier maturing varietis and the acceleration of plant growth and early fruiting resulting from the early-season insect-control program, it may also become feasible farther north in Texas and possibly in other States.

Educational Program

Educational agencies have contributed greatly to the cotton-insect control program in the Southwest. Without their aid in carrying information to the farmer, there could never have been much progress regardless of the effectiveness of the recommended control measures. It would be impossible to name all agencies, organizations, and individuals who contributed to the success of the program.

In Texas a great deal of the credit for coordinating the leadership so that everybody would be carrying the same message goes to Eugene Butler, chairman of the Insect Control Section, State-wide Cotton Committee of Texas. This coordination of efforts on a State-wide level, combined with capable and enthusiastic leadership on area, county, and community levels, had a tremendous influence in making the cotton-insect control program the success it is today.

State Guides

(Continued from Page 113)

increase in the aphid population often results. This can be prevented by using 3-5-40 in alternate applications.

3-5-40 mixture (3% gamma isomer of benzene hexachloride — 5% DDT — 40% sulphur) will control the boll weevil, cotton aphid, bollworms, cotton leafworm, cotton fleahopper, tarnished plant bug, rapid plant bug, thrips, fall armyworm, cutworms, grasshoppers, and suppress spider mites.

20-40 mixture (20% toxaphene — 40% sulphur) will control the boll weevil, bollworms, cotton leafworm, cotton fleahopper, tarnished plant bug, rapid plant bug, thrips, cutworms, fall armyworm, grasshoppers, and suppress spider mites.

Aldrin - DDT - Sulphur mixture (2½% Aldrin — 5% DDT — 40% sulphur) will control the boll weevil, bollworms, thrips, cotton fleahopper, tarnished plant bug, rapid plant bug, grasshoppers, and suppress spider mites. Aphid infestations often develop when this mixture is used.

Dieldrin-DDT-Sulphur mixture (1½% dieldrin—5% DDT—40% sulphur) will control the boll weevil, bollworms, thrips, cotton fleahopper, tarnished plant bug, rapid plant bug, grasshoppers, and suppress spider mites. Aphid infestations often develop when this mixture is used.

Heptachlor - DDT - Sulphur mixture (2½% heptachlor—5% DDT—40% sulphur) will control the boll weevil, bollworms, thrips, cotton fleahopper, tarnished plant bug, rapid plant bug, grasshoppers, and suppress spider mites. Aphid infestations often develop when this mixture is used.

ATTENTION: The present indications are that sulphur will be in short supply for use in cotton insecticides in 1952. It may be necessary to use these insecticide mixtures without sulphur. If infestations of spider mites develop, use one of the materials recommended for spider mite control.

DDT will control bollworms, cotton fleahopper, tarnished plant bug, rapid plant bug, cutworms, fall armyworm, and thrips. Its use alone may be followed by severe cotton aphid and spider mite infestations. In case of heavy infestation of bollworms, 10% DDT instead of 5% in the above mixtures containing DDT should be used.

Nicotine, 3% in lime, can be used to knock out heavy aphid infestations.

Sulphur should be included in all organic insecticide mixtures to prevent the build-up of spider mite infestations. Heavy applications will control established infestations.

Parathion is very effective for control of the cotton aphid and spider mites.

Parathion is an extremely dangerous poison. It is recommended for cotton only as a dust where trained personnel or other individuals are in position to assume full responsibility and to enforce proper precautions as prescribed by the manufacturer.

TEPP (tetraethyl pyrophosphate) is effective as a spray against the cotton aphid and spider mites. Best control is obtained when the plants are dry at the time of application. TEPP deteriorates very rapidly when exposed to moisture or moist air and therefore should be applied immediately after being mixed with water. It is incompatible with alkaline materials.

Tetraethyl pyrophosphate is an extremely dangerous poison. It is recommended for use on cotton only where a qualified person is in position to assume full responsibility and to enforce proper precautions as prescribed by the manufacturer.

Aramite at the rate of .4 to .6 pound of the technical material per acre, per application, has given satisfactory control of some species of spider mites. It can be applied either as a dust or spray.

Sprays

Sprays of the insecticides recommended herein, except calcium arsenate, are as effective as dusts when used in the same amounts and at the same intervals between applications.

The amount of the technical materials contained in different emulsifiable concentrates may vary between materials and also formulations of the same material. In using a spray concentrate, the actual number of pounds of the insecticide there is per gallon must be known in order to determine the amount of the concentrate to use per acre. The number of pounds of the technical material contained per gallon is given on the label of most of the spray concentrates offered for sale for cotton insect control. The quantity of finished spray applied per acre will vary with the type and speed of the equipment.

General Precautions

The insecticides recommended for cotton-insect control are poisonous to man and animal. The following suggestions should be followed when handling these materials:

1. Buy only properly labeled insecticides.

(Continued on Page 119)

In '52: Save the Bolls - Produce the Bales

Progress of Cotton Insect Control in The Far West

By W. A. STEVENSON

THE USE OF insecticides is now generally recognized as a "must" to profitable cotton production in the West, the author points out, and oftentimes results in yield increases of a bale or more per acre.

THE COTTON-INSECT problems in the irrigated sections of the Far West are very complex. Each area presents a different problem. The insects involved include several lygus bugs, stink bugs, the bollworm, the beet armyworm, thrips, aphids, the cotton leaf perforator, several beetles, and the salt-marsh caterpillar. In some seasons the cotton leafworm causes damage in parts of Arizona and New Mexico, but this insect has never been reported in California. Spider mites are also serious pests in many parts of the West. The relative importance of these pests varies from section to section and from year to year. Spider mites, salt-marsh caterpillars, and bollworms seem to be on the increase.

It was recognized in the early 1930's that insects were causing serious losses in yields and grades to much of the cotton grown in Arizona. The principal offenders at that time were the lygus bugs and stink bugs. Extensive field experiments were undertaken with insecticides then available, and surprising increases in yields were obtained with several sulfur-arsenical mixtures. A mixture containing 7.5 percent of paris green and 92.5 percent of sulfur proved the most effective and was recommended for control of the sucking insects. Large quantities of this mixture were used by the cotton growers in the West during the late 1930's and early 1940's. However, the results were erratic, and it was recognized that a more effective general insecticide was needed.

Tests on caged cotton plants in Arizona during 1944 showed a higher mortality of stink bugs and lygus bugs with DDT dusts than with the recommended sulfur-arsenical mixture. During 1945 and 1946 DDT was tested under field conditions and proved so far superior to the sulfur-arsenicals that they passed completely out of the picture in 1947. A sulfur dust containing 5 percent of DDT was recommended and used extensively. The control of stink bugs, however was not entirely satisfactory. It was also found that DDT did not control aphids. BHC then made its appearance and a dust containing 5 percent of DDT, sufficient BHC to give 2 percent of the gamma isomer, and 50 percent of sulfur proved after many tests to be an excellent general-purpose insecticide. In fact, it is still recommended for use against practically all cotton pests except salt-marsh caterpillars and certain spider mites that have proved highly resistant to sulfur.

Toxaphene is also used now for control of many of the cotton pests in the West. Alone or mixed with DDT it has proved very effective against the salt-marsh caterpillars, as well as most of the other insect pests.

The use of insecticides is now generally recognized as a "must" to profitable cotton production in the West. The increases in yields from the proper use of insecticides are large, oftentimes amounting to a bale or more per acre.

During the last two years the early control of thrips has proved very profitable in some areas. In a large-scale experiment in Arizona in 1951 one application of a 10 percent toxaphene dust increased the yield of seed cotton by 420 pounds per acre over the yield in plots treated later in the season for control of the beet armyworm and bollworm. The over-all gain from an early application of 10 percent DDT for beet armyworms and bollworms was 921 pounds of seed cotton per acre. Similar experiments in 1950 also showed profitable gains from early thrips control. In 1951 large acreages were treated for thrips, and undoubtedly in 1952 even larger acreages will be treated.

Much progress has been made with liquid insecticides, and the trend is now towards liquids, for in many cases they have proved superior to dusts. Liquids are more acceptable to the general public, especially beekeepers, and can be applied under more adverse weather conditions than can dusts.

Spider mite control is one of the greatest problems in many areas. Sulfur, which is in short supply, is still considered the ranking insecticide for mites, but for certain species repeated applications of parathion are necessary.

Salt-marsh caterpillars also present a problem. During several years they have built up to millions in numbers late in the season in many cotton areas in Arizona and California. When these infestations occur sufficiently late in the season, defoliation of the cotton is oftentimes an advantage. However, in 1951, when a late frost appeared, much of the late-planted cotton was seriously damaged by these pests. The caterpillars can be controlled

W. A. STEVENSON is Entomologist, U.S. Department of Agriculture, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, Tucson, Ariz.

with toxaphene-DDT emulsions or dusts, and in 1952 more insecticides will be used for their control, particularly in the warmer valleys.

The major portion of American-Egyptian long-staple cotton grown in the United States is produced in the West. Because this cotton commands premium prices, special efforts will be aimed at both early and late insect control on this important crop.

Good control has been obtained with many of the new insecticides and combinations, but in 1952 the principal insecticides used commercially will be DDT, toxaphene, BHC and parathion. Sulfur will be incorporated in all the dust mixtures, if in supply.

General surveys for cotton insects have proved highly profitable in the West. Many threatening infestations have been discovered, and brought under control before they developed to serious proportions. Timely reports on cotton-insect conditions are issued by the Extension Service, which is highly regarded by the cotton industry and has given valuable advice and aid in insect-control programs. Many growers are hiring scouts to examine their fields for insects during the growing season. This practice is encouraged by the Bureau of Entomology and Plant Quarantine.

The cotton growers in the West are sold on insect control—in fact, many are oversold. In many instances excessive poundages and applications are made, but the over-all picture is good. Although the control secured is reflected in the very high yields in recent years, the goal is for still higher yields.

State Guides

(Continued from Page 117)

2. Study and follow precautions given on the label.

3. Do not open containers in closed rooms.

4. Avoid breathing the fumes of insecticides.

5. Wear a recommended respirator when handling or applying insecticides.

6. Wear plastic-coated gloves when handling spray concentrates and wash hands frequently with soap and water.

7. If liquid concentrates are spilled on skin or clothing, remove clothing and bathe with soap and water immediately.

8. Take bath, using soap freely, and change clothing following exposure to insecticides.

9. Store insecticides where they are inaccessible to children and animals.

10. Avoid contamination of ponds and streams.

11. Avoid drift of insecticides onto pastures, feed or food crops.

12. Destroy empty containers by burning them in the open or burying them.

Application of Insecticides

Application of dusts: All cotton dusts may be applied during either the early morning, late afternoon, or night **when the air is calm.** For effective control, it is necessary that the dust stay down among the plants and not rise and float away. For this reason, late afternoon and night applications are preferable to early morning applications. **Complete coverage is necessary.**

Any type of cotton duster, either ground machine or airplane, may be used to apply dusts. The swath should never be wider than that which is recommended for the particular machine. Never depend on drift for coverage. In the case of airplane applications, the swath should never be wider than the wingspread of the airplane. Marking of swaths by flagging is essential.

Application of sprays: Sprays may be applied by ground machine or airplane. The swath should never be wider than that which is recommended for the particular machine. Never depend on drift for coverage. In the case of airplane applications, the swath should never be wider than the wingspread of the airplane. Marking of swaths by flagging is essential.

When spraying with tractor equipment, use 1 nozzle per row on small cotton, 2 nozzles per row on cotton approximately 20 inches high, and 3 nozzles per row on cotton 2 feet or higher.

1952 Cotton Insect Control Recommendations for:

Mississippi

Destructive cotton insects constitute a major threat each year to the maximum production of cotton in Mississippi. Their abundance varies according to the factors which are favorable or unfavorable for their reproduction and development. Those factors can change from an unfavorable condition to one that is favorable within a relatively short time.

SUPER SERVICE

to the Mid-South and Southwest has always been our policy. So, during 1951 we acquired:

★ Two more branch plants (Monroe, Louisiana, and Jacksonville, Arkansas). Now from seven plants we can deliver within 10 hours to any point in the Southwest or Mid-South.

★ Several additional entomologists and chemists (with many years of practical experience).

★ De-Pester Farms, Inc. (Seven hundred acres of Delta land for developing, testing and evaluating insecticides, herbicides, and other agricultural chemicals and application procedures).

DE-PESTER Brand Products

BHC	CHLORDANE
DDT	SULPHUR
TOXAPHENE	RHOTHANE
ALDRIN	2,4-D
DIELDRIN	DEFOLIANTS

CONCENTRATES (Liquids and Dust Bases)
FORMULATIONS (Finished Dusts and Sprays)

Agricultural Chemicals, Inc.

General Office and Main Plant
LLANO, TEXAS

Eight processing and mixing plants in Texas, Louisiana, Mississippi, Arkansas and Peru, S.A.

This is especially true of the boll weevil which is at present considered our major pest. In view of these conditions every grower should be prepared to follow through with the control program which best fits his particular farm program.

Thrips damage in recent years has increased to such an extent that, with available effective insecticides, control measures are generally recommended. Their control is especially important where an early maturing crop is desired.

The boll weevil is an annual threat to the crop of every cotton grower in the state. Its abundance usually will vary from field to field or even in the different parts of relatively large fields. For that reason growers should check their individual fields for damage even though the amount of damage being done in the community may be considered low.

In recent years bollworms and red spiders have played an increasingly important role in the production of cotton. Whether this increase is due to changing farm practices or to temporary conditions particularly favorable for them remains to be determined. In either case the experiences of the last three or four years certainly justify careful checks for their presence in damaging numbers and the necessary preparation for control measures.

One cause of heavy losses due to insect damage some years is the failure on the part of the grower to consider insect control as a necessary part of the production program. It is good insurance to have on hand the necessary machinery in good working order and enough insecticide to make three to five applications to each acre that is being planted. If dusts are used this will mean stocking 30 to 50 pounds for each acre planted. If a spray is used the amount of emulsion concentrate required will vary with the insecticide. It can be easily calculated from the dilution table.

When to Poison For Thrips and Cutworm

Spray or dust when first pair of leaves spread (before chopping.) Make a second treatment 7 to 10 days later.

Boll Weevil and Other Insect Control

Early Season:

1. Spray or dust when first squares appear in areas heavily infested with weevils or other injurious insects. This might be **spot poisoning** in large fields in the delta and entire fields in hill areas.

2. Poison once each week for 3 to 4 weeks, ending about the last week in June or the first week in July.

Mid-Season:

3. Make square infestation counts and poison when 15 to 25 percent of the squares are infested.

A simply way of making an infestation count is to pick 100 squares while walking diagonally across a field in two directions. Pick them equally from top, middle and lower limbs. The number of punctured squares out of each 100 picked is the percent infestation for that count.

4. Make at least 3 treatments at 4- or 5-day intervals.

5. Make infestation counts 1 or 2 times a week to determine if additional treatments are needed.

Late Season:

6. Protect cotton from weevils at migration time until bolls are at least 3 weeks old. The interval between treatments should usually not be over 4 days apart at weevil migration. Bolls maturing in September and October will require protection until 4 or 5 weeks old.

Bollworm Control

Begin poisoning immediately when 10 to 15 eggs or 3 or 4 small worms are found per 100 terminal buds. Bollworm control should always start as soon as eggs begin to hatch or while worms are small and in top part of plant. At this time they can easily be controlled. If the worms are allowed to become large, the dosage must be increased. DDT at the rate of 0.5 pound per acre will control small worms but large worms require 1.0 pound or more per acre for good control.

Cotton Insecticides—1952

Insect control is affected by the quality of insecticide being used. This applies equally to dust and liquid insecticides.

Regardless of material used, the success or failure of controls depends on proper application and timing.

Dusts (Listed alphabetically and not in order of preference)

• **Aldrin (2½-0-0 and 2½-5-0)**—A 2½% aldrin dust at recommended amounts will control boll weevils, thrips, cotton flea hopper and rapid and tarnished plant bugs. Aldrin will not control cotton aphids (lice), bollworms or spider mites. If DDT is not used with aldrin in the early applications, there should be no problems with cotton aphids. Aldrin will give a quick kill of weevil. A mixture of 2½% aldrin and 5% DDT will control bollworms.

Alrin is compatible with all of the new organic poisons recommended for cotton insect control. If aldrin is washed off in less than 10 hours repeat application immediately; if in 10 to 24 hours, repeat the third day.

• **Dieldrin (1½-0-0 and 1½-5-0)**—A 1½% dieldrin dust at recommended amounts will control thrips, boll weevil, cutworms, cotton fleahopper and plant bugs. Cotton aphids do not usually build up following its use, unless DDT is included in the mixture. It is better to use dieldrin without DDT early in the season.

Dieldrin is a relatively slow killing poison. It is a preferred material for early season control, especially if cutworms are a problem. Dieldrin alone is not a satisafctory control for bollworm. Where this insect is a problem, a mixture of 1½% dieldrin-5% DDT should be used.

• **Gamma BHC-DDT (3-5-0) and Gamma BHC-DDT-Sulphur (3-5-40)**—This is a mixture of benzene hexachloride and DDT. The benzene hexachloride will give a quick kill of insects. This mixture, when used in recommended amounts, will control boll weevil, thrips, cotton aphids, cotton fleahopper, plant bugs, and bollworms. Sulphur is added to suppress red spiders. In Mississippi, however, a 40% sulphur in the mixture does not always do a good job of suppressing red spiders.

• **Heptachlor (2½-0-0 and 2½-5-0)**—A 2½% heptachlor dust at recommended amounts will control boll weevils, thrips, cotton fleahopper, rapid and tarnished plant bugs. Heptachlor will not control cotton aphids, bollworms or spider mites. If DDT is not used with it in the early season applications, there should be no problem with cotton aphids. Heptachlor will give a quick kill of boll weevil. A mixture of 2½% heptachlor and 5% DDT will control bollworms.

Heptachlor is compatible with all of the new organic poisons recommended for cotton insect control. If an application is washed off in less than 10 hours, repeat immediately; if in 10 to 24 hours, repeat the third day.

• **Lime-Free Calcium Arsenate-1% Parathion**—This mixture of neutral calcium arsenate and parathion at 10 pounds to the acre has given good control of the boll weevil and prevented infestations of aphids and red spiders.

• **Parathion**—A 1% dust at 10 pounds per acre will control red spiders and aphids. **Parathion is a very dangerous poison but can be used safely, if proper precautions are followed.**

• **Toxaphene**—Twenty percent toxaphene dust at recommended amounts will control boll weevil, thrips, cutworms, cotton fleahopper, rapid and tarnished plant bugs, yellow striped armyworm, garden web worm, and will give control of small bollworms. Cotton aphids usually will not become a problem when toxaphene is used unless it is mixed with DDT or alternated with calcium arsenate. It will not control spider mites or heavy infestations of aphids.

Toxaphene is a relatively slow killing poison. It is a preferred poison to use in the early season, especially if cutworms are a problem. For heavy infestation of bollworms, increase dosage to at least 15 to 20 pounds per acre, containing at least 2½% DDT.

Rates of Dust Insecticides Per Acre

For thrips control, use 5 to 7 pounds per acre.

For boll weevil control in mid-season, use at least 10 pounds per acre 4 or 5 days apart.

For boll weevil control at migration time, use 12 to 15 pounds per acre.

Sprays

Emulsifiable concentrates (liquid sprays) of aldrin, dieldrin, gamma BHC, heptachlor, and toxaphene, as well as combinations of these with DDT will be available in 1952.

In a successful spray program it is essential that good emulsifiable concentrates be used. The emulsion must be stable. After mixing with water, the oil must not separate from the water.

A good emulsion should not cream at top or settle to bottom for at least 20 to 30 minutes after mixing.

The emulsion must be free of trash or foreign matter.

Do not buy a liquid concentrate unless the pounds of technical insecticide per gallon are stated on the label.

• **Aldrin**—For thrips control on cotton just up, 0.08 pound per acre is required. This amount should be increased to ¼ pound per acre by July for control of boll weevil and other pests, and to at least 1/3 pound in late season or where infestations are heavy. For bollworm control, add ½ pound technical DDT per acre. Concentrates containing 2 pounds per gallon are suggested.

• **Dieldrin**—Dieldrin should be used at the rate of 0.05 pound per acre for thrips control; 0.10 pound for cutworms

Mississippi Cotton Insect Control Calendar—1952

Insect	Treatment and Interval	Dusts and Lbs. Per Acre	Sprays and Nozzles Per Row
		Early Season Control	
Cutworms	When worms appear, repeat as necessary	10% DDT, 1½% dieldrin or 20% toxaphene—10 lbs.	DDT, dieldrin or toxaphene—1 nozzle
Thrips	When 2 seed leaves spread 2-3 applications at 7 day intervals	2½% aldrin, 5% DDT, 1½% dieldrin, 3% gamma BHC-5% DDT, 2½% heptachlor or 20% toxaphene, 5-8 lbs.	Aldrin, DDT, dieldrin, GBHC, heptachlor, toxaphene—1 nozzle
Overwintered Boll Weevil, Fleahopper, tarnished and rapid plant bugs	At first squaring if insects present, 3 or 4 applications at weekly intervals	2½% aldrin, 1½% dieldrin, 3% GBHC-5% DDT, 2½% heptachlor, or 20% toxaphene, 5-8 lbs.	Aldrin, dieldrin, GBHC, heptachlor, or toxaphene—1 or 2 nozzles, depending on cotton size
		Mid- and Late-Season Control	
Boll Weevil	15 25% infestation, 3 applications, 4-5 day intervals	Same as above 13-15 lbs. or calcium arsenate 10 lbs.	Aldrin, dieldrin, GBHC, heptachlor, or toxaphene—3 nozzles
Bollworms	When 10 to 15 eggs or 3 or 4 small worms are found per 100 terminal buds	2½% aldrin-5% DDT, 10% DDT, 1½% dieldrin-5% DDT, 3% gamma BHC-5% DDT, 2½% heptachlor 5% DDT, or 20% toxaphene-2½% DDT, 12 to 15 lbs. or 20% toxaphene—15 to 20 lbs.	Add DDT to above at rate of 0.25 to 1.0 lbs. per acre—3 nozzles
Leafworm	When worms appear—repeat as needed	Calcium arsenate, 3% gamma BHC-5% DDT or 20% toxaphene—10-15 lbs.	GBHC, toxaphene—3 nozzles
Aphids	At first honeydew—repeat as needed	3% GBHC-5% DDT, 1% parathion—10 lbs.	GBHC or TEPP—3 nozzles
Tarnished and rapid plant bugs	When insects noted—repeat as needed	Same as for boll weevil except calcium arsenate	Same as for boll weevil
Fleahopper	10 to 35 per 100 terminals	Same as for boll weevil except calcium arsenate	Same as for boll weevil
Red Spiders	When leaves turn a bronze color, 5 to 7 days	1% parathion—10 lbs., sulphur 20-30 lbs.	TEPP 3 nozzles, 0.1 to 0.2 lb. Aramite 0.3 lb. per acre
Grasshoppers	When damage occurs	2½% aldrin, 1½% dieldrin, 20% toxaphene—10 lbs.	Aldrin, dieldrin, toxaphene—3 nozzles
Yellow Striped Armyworm	When damage occurs	3% EPN—10 to 12 lbs. or 1½% dieldrin-5% DDT, or 20% toxaphene—15 lbs.	Dieldrin 0.15—DDT ½ lb., toxaphene 3 lbs. or EPN 0.3—3 nozzles

Dilution Table for Cotton Emulsion, Using 1 Gallon Per Acre Nozzles

Insecticide	Lbs. Poison per gallon	Water per gallon of concentrate	Poison per acre 3 nozzles	Acres covered with nozzles per row		
				1	2	3
Aldrin	2.0	23	0.25	24	12	8
Dieldrin	1.5	29	0.15	30	15	10
Gamma BHC	1.2	8	0.4	9	4.5	3
" "	1.6	11	0.4	12	6	4
Heptachlor	2	23	0.25	24	12	8
Toxaphene	6.0	6.2	2.5	7.2	3.6	2.4
"	8.0	8.6	2.5	9.6	4.8	3.2
DDT	2	11	0.5	12	6	4
"	3	17	0.5	18	9	6
Tetraethyl Pyrophosphate (TEPP)	2.0	59	.1	60	30	20
" " "	4.0	119	.1	120	60	40

NOTE: The dilution should remain the same for thrips control or boll weevil control, the only difference being in the number of nozzles. For thrips control, use 1 nozzle per row. For early boll weevil control, use 2 nozzles per row. Where cotton is over 2 feet tall, use 3 nozzles per row. For boll weevil control at migration time use ⅓ less water. All dilutions are based on applying 1 gallon per acre with each nozzle used per row.

and early season boll weevil control; and 0.15 to 0.20 pound per acre for mid- and late-season boll weevil control. For control of bollworms add ½ pound technical DDT per acre when needed. Concentrates containing 1½ pounds dieldrin per gallon are suggested.

• **Gamma Benzene Hexachloride** — Use 0.10 pound per acre for thrips control on seedling cotton; 0.20 to 0.3 pound per acre for early season weevil control and 0.4 pound per acre for late season. For bollworm control add ½ pound technical DDT per acre. Concentrates containing 1.2 or 1.6 pound per gallon are suggested. (Combinations of BHC and DDT will be commercially available in 1952. For boll weevil control follow BHC-dilution rates. For bollworm control follow DDT dilution rates.)

• **Heptachlor**—For thrips control on cotton just up, use 0.08 pound per acre; for early season boll weevil use 0.16 pound per acre; for mid- and late-season control use at least ¼ to 1/3 pound per acre. For bollworm control add ½ pound technical DDT per acre. Concentrates containing 2 pounds per gallon are suggested.

• **DDT**—When bollworm control becomes necessary, emulsifiable concentrates containing DDT should be added to sprays for each boll weevil control, or if DDT is used alone at a rate of ½ pound technical DDT per acre. With toxaphene, only ¼ pound DDT per acre is needed. Concentrates containing 2 or 3 pounds of DDT per gallon are suggested.

• **Tetraethyl Pyrophosphate (TEPP)** — This is suggested for aphid and red spider control at the rate of 0.10 to 0.20 pound per acre in ground machines. A concentrate containing 4 pounds of the technical material per gallon is suggested. **TEPP is very toxic and should be handled with caution.**

• **Toxaphene**—Use 0.80 pound per acre for control of thrips and cutworms on cotton just out of the ground; 1.6 pounds for early season weevil control and 2½ to 3 pounds per acre for mid- and late-season control. For bollworm control add ¼ pound technical DDT per acre. Concentrates containing 8 pounds per gallon are suggested.

Rates of Spray Insecticides

For thrips and cutworm control, apply 1 gallon of diluted insecticide per acre with 1 nozzle per row, using 30 pounds pressure. The nozzles should be 6 inches to 10 inches from top of cotton. In windy weather tip may be as close as 4 inches to top of plant.

For early boll weevil control. On cotton 12 to 20 inches high, apply 2 gallons of mixture per acre, using 2 nozzles per row and 30 to 40-pounds pressure. Larger nozzle tips require higher pressure.

For mid- and late-season weevil control. On cotton over 24 inches high apply 3 gallons of mixture per acre, using 3 nozzles per row and 40 pounds pressure. Center nozzle should be 6 to 10 inches from top of cotton. Do not allow nozzles to drag through cotton leaves or branches.

If heavy weevil migration occurs, the dosage of all insecticides should be increased approximately 1/3. This can be done by using 1/3 less water in making dilution.

1952 Cotton Insect Control Recommendations for:

Missouri

Cotton grown under Missouri conditions has not been subject to much insect damage on the average. Therefore

routine spraying or dusting is not profitable unless there is a definite insect problem. In only a few areas is there a boll weevil problem. Occasionally cotton leafworms become numerous enough to require control measure. Cotton bollworms may cause some loss as well as red spider in favorable seasons.

Where insect problems develop it is important that the species of insect be determined before control measures are applied. Missouri Bulletin 545 illustrates the more common pests of cotton and will aid in identification.

Insecticides used as sprays come in two types of formulations, liquid and wettable powder. Where low volume sprayers are being used it is necessary to use only the liquid forms. The wettable powders usually cause trouble by clogging the nozzles of equipment designed for using concentrates on row crops.

1952 Cotton Insect Control Recommendations for:

New Mexico

New Mexico Cotton Statistics, 1951 (Preliminary Unofficial Estimates)

Value of lint and seed	$69,000,000
Acres harvested	320,000
Bales produced	284,000

Recommended Sprays for Cotton Insect Control in Missouri—1952

Insect	Insecticide and Rate per Acre* (Use emulsifiable concentrates only)	When to Apply and Remarks
Aphids "Plant-lice"	BHC at 1/3 lb. of gamma isomer per acre or lindane at 1/3 lb. or nicotine at 3-5 lbs.	Same as for dusts. Add toxaphene or DDT for mid-season and late season bollworm control.
Armyworms and Cutworms	Toxaphene at 2-3 lbs.	Same as for dusts.
Boll Weevil	Toxaphene at 2-3 lbs. or toxaphene plus DDT at 1-2 lbs. of toxaphene and 1/2 to 1 lb. of DDT or .25 lbs. aldrin or .15 lbs. dieldrin	Same as for dusts.
Bollworm	Toxaphene at 2-3 lbs. or toxaphene plus DDT at 2-3 lbs. of toxaphene and 1-2 lbs. DDT or DDT at 1-2 lbs.	Same as for dusts.
Fleahoppers, Lygus Bugs, Stink Bugs, Rapid Plant Bugs, and Thrips	Toxaphene plus DDT at 1/2 lb. of toxaphene and 1/4 lb. of DDT	Same as for dusts.
Grasshoppers	Toxaphene at 2-2 1/2 lbs. or chlordane at 1-1 1/2 lbs. or BHC at 1/3 to 1/2 lb. gamma isomer	Same as for dusts. See your County Agent for other grasshopper control recommendations.
Leafworm	Toxaphene at 2 to 3 lbs.	Same as for dusts.
Red Spider Mites	Compound 88R at 1/2 to 1 lb.	Same as for dusts.
Garden Webworms	Toxaphene at 2 to 3 lbs.	Same as for dusts.

*Note: The amounts per acre listed above refer to the technical material, thus toxaphene at 2 or 3 pounds means 2 to 3 pounds of the actual or technical toxaphene per acre. This amount varies with the different formulations of the various chemical companies.

Recommended Dusts for Cotton Insect Control in Missouri—1952

Insect	Insecticide and Rate per Acre	When to Apply and Remarks
Aphids "Plant-lice"	3% nicotine at 10-15 lbs. or 3-5-40 mixture at 10-15 lbs. or 3% gamma BHC at 10 lbs. (Add 10 lbs. of 10% DDT for bollworms)	When curled leaves or honeydew or both appear. Note: To avoid bollworm trouble, do not use BHC alone in mid- or late-season.
Armyworms and Cutworms	20% toxaphene plus 40% sulfur at 10 to 15 lbs.	When one or two worms per linear foot of row are present or when migration into cotton begins.
Boll Weevil	20% toxaphene plus 40% sulfur at 10-15 lbs. or 3-5-40 mixture at 10-15 lbs. or calcium arsenate at 10-15 lbs. or 2 1/2% aldrin at 8-10 lbs. or 2% dieldrin at 8-10 lbs.	When 25 bolls per hundred plants show infestation. Repeat at 4-5 day intervals until control is obtained.
Bollworm	10% DDT plus 40% sulfur at 10-15 lbs. or 20% toxaphene plus 40% sulfur at 10 to 15 lbs. or calcium arsenate at 16 lbs.	When eggs and 4 or 5 worms are found for every 100 plant terminals examined.
Fleahopper, Lygus Bugs, Rapid Plant Bugs, Stink Bugs, and Thrips	10% toxaphene plus 40% sulfur at 10-15 lbs. or 5% DDT plus 75% sulfur at 10-15 lbs. or 3-5-40 mixture at 10-15 lbs. or sulfur at 15 to 20 lbs.	When 25-30 bugs per 100 terminals are present.
Grasshoppers	20% toxaphene plus 40% sulfur at 10-15 lbs. or 10% chlordane at 10-15 lbs. or 3% gamma BHC at 10-15 lbs.	When 4 or 5 'hoppers per square yard are present. See County Agent for other grasshopper control recommendations.
Leafworm	20% toxaphene plus 40% sulfur at 10-15 lbs. or 3-10-40 mixture at 10-15 lbs. or calcium arsenate or lead arsenate or paris green } at 10-15 lbs.	When leafworms appear early, time applications to hit newly hatched worms of second brood.
Red Spider Mites	Sulfur at 20 lbs. or 5% Compound 88R ("Aramite," "Aramex," etc.) at 10 lbs.	When reddening and curling of leaves or webbing or mites appear.
Garden Webworms	20% toxaphene plus 40% sulfur at 10-15 lbs. or 3-5-40 mixture at 10-15 lbs. or calcium arsenate at 10 lbs.	When worms and webbing appear.

Want

EXTRA COPIES

of this issue?

We have made what we hope is a liberal over-run on this issue, because the demand for extra copies is always heavy. In past years, however, the supply has been exhausted quickly—so if you want extra copies, wire us or drop us a line right away. The price is 25¢ per copy.

Want

EXTRA COPIES

of the "Beneficial Insect" Section?

The four page section in the center of this issue entitled "Cotton's Beneficial Insects," printed in four colors, is available in pamphlet form in limited numbers. We had no way to calculate the demand for this section, and printed only five thousand extra copies in pamphlet form. We will fill requests in the order received. The price is $5 per hundred, delivered.

Write or wire

The Cotton Gin and Oil Mill Press

P. O. Box 444

DALLAS 1, TEXAS

Tons of seed produced	114,000
Yield per acre (lint)	425 lbs.
Total value per acre	$ 215.60
Insect losses	$ 6,000,000
Reduction from full yield	8%
Amount of lint lost (bale)	24,695
Amount of seed lost (tons)	9,913
Value of loss per acre	$ 18.75

Reduction from full yield has been reported as high as 20 per cent by some entomologists in the state. We have no accurate way of checking this so I have arrived at the above figures by comparing last year's yield per acre with this year's yield per acre and used an approximate part of that as insect damage.

1952 Cotton Insect Control Recommendations for:

North Carolina

Because of the rather "light" weevil year during 1951, there is some concern that growers may conclude that 1952 will also be a "light" weevil year and that other pests will not be a serious problem. It is hoped that the year of 1950, when the boll weevil was largely responsible for an all-time low state average of 149 pounds of lint cotton per acre, will not be forgotten very soon. The loss in North Carolina, which might have been largely prevented, ran up to $50,000,000 that season. Records show that North Carolina growers must be prepared to follow a good insect control program every season if the state expects to keep its place in cotton production.

The use of insecticides played an important part in the high yield of cotton per acre during 1951 in North Carolina but they are not given all of the credit. Cotton growers, generally speaking, had a good year since the insect populations generally did not reach epidemic proportions. It was a dry season in most sections which followed an abnormally severe cold and dry winter. The weather factors beyond any doubt had much to do with the rather moderate boll weevil situation and helped growers to produce a high state average of 382 pounds of lint cotton per acre. Low and prolonged cold temperatures reduced overwintering weevil numbers to a low point. The cool and dry spring in most sections further retarded "Enemy Number One," the boll weevil. Hot and continued dry conditions prevented development of large populations until late in the season. Thrips and aphids failed to seriously harm the crop. Bollworms generally were not a major problem; however, in a few fields where rains and other factors caused late growth the pest seemed to be attracted to such fields. In a few cases the use of insecticides for the control of this insect did not give uniformly good results. Often they were applied too late.

Experience has shown that insect control is a factor each season even though there may be much variation in abundance of the pests from season to season. It simply means that growers must watch developments day to day and week to week and be prepared to carry out control measures throughout the season. Not all of the pests mentioned above are likely to show up in any one field but in some sections, for instance, in the lower Piedmont, thrips may be an early season problem. Every grower should acquaint himself with the different pests and be able to recognize the damage in time to protect his crop. By doing this growers may not need to apply 12 to 15 weekly applications of insecticides beginning at the time the plants come out of the ground. Materials applied when not needed wastes scarce items and labor. On the other hand, it is necessary to apply materials before populations bulid up and damage is severe.

By checking their fields and making regular infestation counts growers can follow developments satisfactorily. County agents are well informed and will be glad to assist growers in checking developments. A weekly state-wide cotton news letter is prepared by entomologists and other workers at State College. Both treated and untreated fields are checked each week in a number of counties. This data is used in the preparation of the state-wide report. This kind of a program when followed throughout the season is very helpful and will enable growers to carefully plan their control efforts.

Each season can be expected to be different. In 1950 when weevil population was high, from 12 to 15 applications were necessary, in the mapority of the fields, for one to get good control of all the different pests. In 1951 many fields

Insect Control Calendar for New Mexico

DUSTS

Insect	Insecticide	Lbs. Mixture Per Acre	Application
Early Season Control			
Fleahopper, Lygus, and Thrips.	5% DDT-40% sulfur; or 5% DDT; or 20% toxaphene-40% sufur; or 20% toxaphene.	10-12	Begin treatment at four leaf stage or earlier if necessary.
Aphid (Cowpea aphid).	3% g BHC-40% sulfur; or 3% g BHC; or 1% parathion.	10-12	When needed. Spot treat if possible.
Armyworm and Cutworm.	5% DDT; or 20% toxaphene; or 5% chlordane.	20	When needed.
Late Season Control			
Bollworm.	10% DDT-40% sulfur; or 10% DDT; or 20% toxaphene-40% sulfur; or 20% toxaphene.	15-20	When eggs and/or 4-5 newly-hatched worms are found on upper ⅓ of 100 plants. Treat at 5-day intervals until control accomplished.
Leafworm.	20% toxaphene-40% sulfur; or 20% toxaphene; or 3% g BHC-40% sulfur; or calcium arsenate.	15-20	When worms first appear.
Fleahopper, Lygus, and Superb Plant Bug.	5% DDT-40% sulfur; or 5% DDT; or 20% toxaphene-40% sulfur; or 20% toxaphene.	15-20	When a total of 8-10 of these insects are taken per 100 sweeps of a 15-16" net.
Stink Bugs.	20% toxaphene-40% sulfur; or 20% toxaphene; or 2-3% g BHC-40% sulfur or 2-3% g BHC.	15-20	When damaging infestation occurs.
Aphid.	3% g BHC-40% sulfur; or 3% g BHC; or 1% parathion.	15-20	When needed.
Red Spider.	Dusting sulfur 1% parathion	25 30 25 30	When leaves begin to show silvering.

SPRAYS (The timing of spray applications should be the same as for dusts.)

Insect	Insecticide	Lbs. Technical per Acre (Pints in some cases)
Early Season Control		
Fleahopper, Lygus, and Thrips.	Toxaphene; or DDT; or toxaphene-DDT (2-1 mixture).	¾-1½ 1 ¾-1½
Aphid (Cowpea aphid).	TEPP, 40% material, parathion, 25% material.	½ pint ½-¾ pint
Armyworm and Cutworm.	DDT; or toxaphene; or toxaphene-DDT (2-1 mixture).	½
Late Season Control		
Bollworm.	Toxaphene; or toxaphene-DDT (2-1 mixture).	2-4
Leafworm.	Toxaphene; or toxaphene-DDT (2-1 mixture).	2-3
Fleahopper, Lygus, and Superb Plant Bug.	Toxaphene; or toxaphene-DDT (2-1 mixture).	2-3
Stink Bugs.	Toxaphene; or toxaphene-DDT (2-1 mixture).	2-3
Aphid.	TEPP, 40% material; or parthion, 25% material.	½ pint ½-¾ pint
Red Spider.	TEPP, 40% material; or parathion (new materials being tested).	½ pint ½-¾ pint

did not even need treatment. Generally, however, from 3 to 6 applications were needed in those fields where boll weevils did show up in damaging numbers. In a few fields thrips, spider mites and bollworms were present along with the weevils and as a result 10 to 12 applications were needed, but this situation was the exception in most sections during 1951 in North Carolina. Should there be questions about making estimates on insect populations or on the infestation on individual farms, it is suggested that growers contact their county extension agent or write State College.

It is likely that a county-wide program which will involve all agricultural agencies will be developed as was done in 1951. Watch for radio and newspaper reports as to early season insect appearance. It is not too early to get equipment ready. Neither is it too early for growers to place an order for at least a part of their insecticide needs. Many growers are trying to keep enough materials on hand for early ap-

Summary of 1952 Cotton Insect Control Recommendations in North Carolina

Important Cotton Pests	INSECTICIDES		Application
	Dusts[5]	Sprays[4] Tech. Material/Acre	
Boll Weevils and Bollworms	20% Toxaphene	1 to 3 lbs. Toxaphene plus ½ to 1½ lbs. DDT	Where weevils are a problem each year, make 3 applications at 7 day intervals beginning at time of squaring. As season advances, make square counts and if infestation rises to 10%[1], make additional applications at 5 days intervals until crop matures[10].
	3% BHC-5% DDT 2½% Aldrin-5% DDT	¼ to ½ lb. BHC or Aldrin plus ½ to 1½ lbs. DDT	
	Other dust and spray materials[9]		During "light weevil years" or prolonged hot, dry weather or in areas[2] where weevil damage is usually light, the infestation rate may be moved up to about 25%. When the control program involves frequent applications during mid and late season, bollworm build-up is usually avoided.
Boll Weevils	Any of the above dusts or sprays may be used without DDT in early season applications when bollworms are not present.		Apply according to infestation as discussed above. Bollworms may develop, especially during late season.
Bollworms[6]	10% DDT	1 to 1½ lbs. DDT	Check for worms frequently during late season when most corn silks turn brown. When 4 to 5 small worms are found per 100 terminals make 2 to 4 applications at 5 day intervals.
Thrips	Any of the dusts or sprays with or without DDT recommended for boll weevil control.		Silvering and/or distortion of leaves indicates the presence of thrips. In areas where thrips are a consistent problem (certain Piedmont areas) make 2 to 4 applications at 7 day intervals beginning at the 2 or 4 leaf stage. Thrips may move to cotton from grain or winter cover crops.
Red Spiders[7]	Sulfur 1% Parathion[8]	⅛ to ¼ lb. Parathion 40% TEPP (¼ pt./Acre)[8]	Make 2 or 3 applications at 5 to 7 day intervals when leaves first begin turning yellow or reddish brown. Coverage of under surfaces of leaves is important.
Aphids	3% BHC-5% DDT 1% Parathion[8]	Above formulations of Parathion or TEPP or BHC[9]	Treat when aphids cause extensive "leaf-curling" especially on young plants. Repeat treatment if needed.

[1]WEEVIL INFESTATION COUNTS: The percentage infestation is based on the number of squares punctured by weevils out of each 100 squares. For fields of five acres or less, 100 squares is considered an adequate sample. The sample size should be increased proportionally for larger acreages. Select squares at random from the top, middle and bottom parts of the plants at representative points throughout the field. The squares may be selected while criss-crossing the field diagonally. Areas adjacent to woods and other hibernating quarters should be especially included in the area sampled.

[2]AREAS WITH CONSISTENTLY LIGHT WEEVIL POPULATIONS: Cotton acreages on or near the northern boundary of our cotton belt fall in this grouping. (For example: Davie and the northern portions of Rowan and Iredell counties).

[3]AMOUNTS OF DUSTS PER ACRE: Early in the season, when plants are small, 6 to 8 lbs. dust per acre is adequate. As plants increase in size, dosages should likewise increase. Average mature cotton may be adequately treated with 15 lbs. dust per acre, while extremely rank cotton will require heavier applications. Applications of dust should be increased above those given by at least ¼th when formulations are applied for bollworms or when sulfur is applied for spider mites.

[4]AMOUNTS OF SPRAY MATERIALS PER ACRE: The amounts of technical material per acre to apply in spray form will also vary according to the size of the plants as discussed for dusts. For example, about 1 lb. of technical toxaphene per acre gives adequate coverage when plants are small; whereas, as much as 3 lbs. of technical toxaphene per acre may be required for good coverage of rank cotton late in the season.

[5]LOW-GALLONAGE AND HIGH-GALLONAGE SPRAYERS: Most spray equipment for cotton is the low-gallonage type which requires emulsion concentrates. Wettable powders may be used in high-gallonage equipment (ex: Boyette tobacco sprayers) but will result in clogging and poor application if used in low-gallonage sprayers. With proper nozzles, emulsion concentrates may be used in high-gallonage equipment. Follow manufacturers recommendations in mixing spray materials and adjusting rates of application.

[6]BOLLWORMS: These pests may become a special problem even when the formulations recommended for a combination boll weevil and bollworm control are used. In such cases DDT as a dust or spray is recommended above all other materials, though toxaphene dust or toxaphene-DDT spray have also given good bollworm control.

[7]RED SPIDERS: Damage from these pests is usually in localized areas and greatest during hot dry weather. Several species of mites infest cotton in North Carolina, each of which may present a different problem in control. While sulfur will control certain mites it will not control all species. We must have more information on the relative abundance and distribution of the various cotton mites, before specific recommendations can be given. Another material, Aramite, has been used with some success for spider mite control in other states. If this material is used, the same precautions as given for handling Parathion should be followed.

[8]CAUTION IN HANDLING INSECTICIDES: All insecticides should be handled only in the manner prescribed by the manufacturer. Extreme caution should be exercised in handling Parathion, Aramite, TEPP, and Dieldrin. Do not use BHC when cotton is to be followed by peanuts or Irish potatoes. For general information see "Precautions on use of Insecticides" in Extension Circular #312, "Cotton Insect Control in North Carolina."

[9]OTHED DUST AND SPRAY MATERIALS: Heptachlor applied at the same rate as Aldrin as either a dust or spray has given as good control in limited field tests as any other material listed. A 1½% Dieldrin-5% DDT dust or a spray containing 1/10 to 1/5 lb. technical Dieldrin plus ½ to 1½ lbs. DDT per acre seems equally effective.

[10]DURATION OF CONTROL PROGRAM: During weevil migration, applications should be continued until all bolls expected to produce cotton are hardened. Such a program is designed to protect tender bolls during this critical period.

Fasco
HAS WHAT IT TAKES TO GET HIM!

Aldrin Toxaphene
Dieldrin BHC-DDT
All Formulations
Dusts and Sprays

FLORIDA AGRICULTURAL SUPPLY COMPANY
DIVISION OF
WILSON & TOOMER FERTILIZER COMPANY
GENERAL OFFICES • JACKSONVILLE, FLORIDA

plications if and when they are needed. This is good insurance and also it will help local dealers since they usually do not have adequate storage. Early purchase of one-third to one-half of the probable insecticide need would be a good practice. One may use 10 pounds of a dust per acre per application as a guide and figure 2 to 5 applications as a probable need. On this basis one may consider early purchase of from 25 to 50 pounds of dust per acre of cotton. This would be 250 to 500 pounds of material for each 10 acres of cotton. This plan also will enable the insecticide manufacturers to plan operation so as to have a supply of materials available.

Supplies during 1952 are not expected to be in surplus. The above plan would prevent a rush movement in May and June and also help prevent development of a probable last minute shortage of materials.

It is recognized that the total cost of cotton production has increased during the past few seasons. Growers cannot afford to ignore insect losses, however. It requires labor, fertilizer and seed to get a crop in. If insects reduce the crop by one-half, a grower cannot stay in business with a one-fourth to one-half bale per acre. Growers must get at least three-quarters to a bale or more of cotton per acre if the grower is to show a profit. The cost of making an insecticide application is about $3 per acre or about $15 per acre for 5 applications. Growers can expect high yields when a good program is followed.

Experience has shown that dusts and sprays are equally effective when properly applied against cotton pests. Spray equipment is somewhat more complex but with careful adjustment good results can be expected. While hand equipment requires more individual labor, even it can be used on small acreages to a good advantage.

Three standard dust mixtures have proved very effective in the control of the boll weevil and several other pests. Two new mixtures have been tried on a very limited scale in North Carolina and appear quite promising. The three widely used dust mixtures are 20% toxaphene, 3% BHC-5% DDT and 2½% Aldrin-5% DDT. The two new mixtures are 2½% heptachlor-5% DDT and 1½% dieldrin and 5% DDT. All of the materials mentioned are available for spray applications and may be secured from local dealers and manufacturers.

The following summary gives details as to dosages and rates of application when the plants are small or large and for the different pests. It should be kept in mind that proper timing and application is very important. Insect control during late July and early August is very important and plans should be made to provide for applications if they are needed. Failure to apply materials at proper intervals during these periods may not control the pests and also fail to protect the crop already set. For best results growers should plan their insect control work carefully and be prepared by (1) knowing the insect pests and their damage, (2) getting equipment ready or making plans for operators to have it available, (3) having some materials available for early applications and, (4) being prepared to continue later applications until early August. "Do Not Plant More Acres Than You Can Properly Handle" seems to be a caution worth heeding.

1952 Cotton Insect Control Recommendations for:

Oklahoma

Cotton insect control recommendations have changed more since World War II than they did in twenty or twenty-five years preceding it. Changes were brought about by the introduction of the new organic insecticides such as DDT, benzene hexachloride, toxaphene, aldrin, dieldrin, heptachlor, and mixtures of these. Some of these insecticides will control one cotton insect pest but not another.

All organic insecticides often cause a red spider mite infestation to develop unless the dust contains at least 40 percent sulfur.

The following dusting materials or combinations of dusting materials have given good cotton insect control in Oklahoma during recent years:

Benzene Hexachloride (3% gamma isomer), 5% DDT and 40% Sulfur Mixture

• **For Boll Weevil Control** — Apply at the rate of 10 pounds per acre when the square infestation is 10 percent or above, or as indicated under paragraph "How and When to Dust Cotton."

Apply at 5-day intervals when air is calm until weevils are under control.

If washed off in 24 hours repeat application.

• **For Bollworm Control**—Apply at the

SPRAYING SYSTEMS

TeeJet® SPRAY NOZZLES

with NEW ConeJet TIPS

to end clogging troubles in cotton spraying

patents pending

CONEJET Tip Assembly fits any TeeJet Spray Nozzle body, replaceable and interchangeable.

COMPLETE NOZZLE supplied with male or female pipe connection and CONEJET Tip.

Designed with single internal passage to reduce possibility of nozzle clogging. The CONEJET Tip is made in a full range of capacities and fits any TeeJet Spray Nozzle. Supplied as tip assembly or as complete nozzle. Ends up to 75% of all clogging troubles. Gives effective spraying in capacities as low as one gallon per acre. Tested and proved the most efficient nozzle ever built . . . for insecticide spraying of boll weevils and other cotton plant pests and for defoliation spraying. For complete information see your dealer or write for ConeJet Bulletin No. 61.

OTHER TeeJet NOZZLES

Flat Spray Tips for pre-emergence and general weed control . . . defoliation spraying . . . and flame cultivation. Cone Spray and Disc Type Tips for related spraying applications. Ask your dealer about these or write for TeeJet Bulletin No. 58.

SPRAYING SYSTEMS CO.

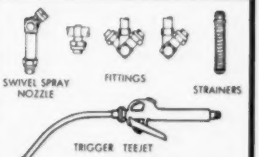
3270 Randolph Street • Bellwood, Illinois

TeeJet® ... THE COMPLETE FARM SPRAY NOZZLE LINE

SPRAY NOZZLES

INTERCHANGEABLE ORIFICE TIPS

FLAT SPRAY CONE SPRAY DISC TYPE CONEJET



SWIVEL SPRAY NOZZLE FITTINGS STRAINERS TRIGGER TEEJET

TYPICAL EQUIPMENT

for the best in performance from equipment and chemicals!

rate of 20 pounds per acre when the bollworms make their first appearance, and if possible before they have entered the cotton bolls.

• **For Cotton Aphid, Cotton Fleahopper, Plant Bug and Leafworm Control** — When the fields are treated with the above mixture for either boll weevil or bollworm control the above insects will also be controlled.

Do not mix this 3-5-40 combination with calcium arsenate, lime or other alkaline materials because the chemical reaction may cause them to be less effective. However, there is a lime-free calcium arsenate that can be mixed with either of the above insecticides. **Dust when the air is calm.**

CAUTION: Benzene hexachloride formulations should not be used where potatoes, peanuts or other root crops will follow cotton the next year for often an objectionable taste is given these crops.

DDT

• **For Bollworm Control Only**—Use a 10 percent dust and apply at the rate of 10 to 15 pounds per acre.

Apply when worms are small and before they enter the bolls.

Dust when the air is calm.

Two or more applications may be required for control.

DDT may cause heavy aphid infestation.

Do not mix DDT with common calcium arsenate, lime or other alkaline materials.

Toxaphene

• **For Boll Weevil Control** — Use a 20 percent dust plus 40 percent sulfur or a 20% dust without sulfur and apply at the rate of 10 to 15 pounds per acre.

Apply at 5-day intervals when the square infestations are 10 percent or above.

If washed off in 24 hours, repeat application.

Dust when the air is calm.

• **For Bollworm Control**—Use a 20 percent dust plus 40 percent sulfur or a 20 percent dust without sulfur and apply at the rate of 20 pounds per acre.

Apply when the worms first make their appearance and before they enter the bolls.

• **For Leafworm, Cotton Fleahopper, Aphids, and Plant Bug Control**—Use a 20 percent dust plus 40 percent sulfur and apply at the rate of 10 pounds per acre.

One application is usually sufficient.

Lime Free Calcium Arsenate Plus 1% Parathion Plus 5% DDT

• **For Boll Weevil, Bollworm, Leafworm, Aphid, and Mite Control**—Use 10 pounds

Oklahoma Cotton Insect Control Recommendations

Insect and Pounds Per Acre

INSECTICIDES	Boll Weevil	Bollworm	Webworm	Leafworm	Fleahopper	Aphid	Spider Mites
DUSTS	For early applications, make first application before squares are large enough to be punctured. Second application seven days after first and third 7 days later if needed. For midseason and later, when 10% of squares are punctured—repeat every 5 days until controlled.	When eggs and 4-5 small worms per 100 plants are found, dust at five day intervals for 3 applications	When worms first appear	When worms first appear	When 15-35 fleahoppers are found per 100 terminals	When honey dew begins to appear	When leaves begin to turn brown
3-5-40 3% g BHC 5% DDT- 40% Sulfur	10-15 lbs.	20 lbs.	10-15 lbs.	10-15 lbs.	7-10 lbs.	10-15 lbs.	
3-5-0 3% g BHC 5% DDT- No Sulfur	10-15 lbs.	20 lbs.	10-15 lbs.	10-15 lbs.	7-10 lbs.	10-15 lbs.	
3-10-40 3% g BHC 10% DDT 40% Sulfur	10-15 lbs.	10 lbs.	10 lbs.	10-15 lbs.	7 lbs.	10 lbs.	
3-10-0 3% g BHC-10% DDT No Sulfur	10-15 lbs.	10 lbs.	10 lbs.	10-15 lbs.	7 lbs.	10 lbs.	
20-40 Dust 20% Toxaphene- 40% Sulfur	10-15 lbs.	20 lbs.	10 lbs.	10 lbs.	7 lbs.		
20-0 Dust 20% Toxaphene- No Sulfur	10-15 lbs.	20 lbs.	10 lbs.	10 lbs.	7 lbs.		
Lime free Calcium Arsenate plus 1% Parathion plus 5% DDT	10 lbs.	10 lbs.		10 lbs.		10 lbs.	10 lbs.
2½% Aldrin plus 5% DDT Dust	10-15 lbs.*	20 lbs.					
1½% Dieldrin plus 5% DDT Dust	10-15 lbs.*	15-20 lbs.					
10% Chlordane plus 5% DDT Dust		10 lbs.					
10% DDT Dust		10-15 lbs.					

SPRAYS	Actual Chemical	Actual	Actual Chemical	Actual Chemical	Actual Chemical	Actual Chemical	Actual Chemical
Toxaphene DDT Spray	1-2 # Toxaphene .5-1 # DDT	2 # Toxaphene 1 # DDT	.75 # Toxa. .375 # DDT	2 # Toxa. 1 # DDT	.5 # Toxa. .25 # DDT		
Toxaphene Spray	2 to 3 #		1 #	1-2 #	.75 #		
BHC-DDT Spray	.24-.36 # g BHC .4-.6 # DDT		.24-.36 # g BHC-.4-.6 # DDT	.24-.36 # g BHC .4-.6 # DDT	.24-.36 # g BHC .4-.6 # DDT	.24-.36 # g BHC .4-.6 # DDT	
Aldrin-DDT Spray	.25-.5 # Aldrin* .5-1 # DDT	.5 # Aldrin 1 # DDT					
Dieldrin-DDT Spray	.25-.5 # Dieldrin* .5-1 # DDT	.4-.5 # Dieldrin .8-1 # DDT					
Chlordane-DDT Spray	.8-1 # Chlordane* .4-.5 # DDT	1 # Chlordane .5 # DDT					
Heptachlor	.5-1 #	1 #					
DDT Spray		1-1.5 #					

*Not proven effective under conditions existing in 1950

per acre at 5-day intervals until insects are controlled. See insecticide chart on when to begin dusting.

Dust any time day or night when the air is calm.

Other Dust Combinations

1.2% Aldrin plus 5% DDT.
10% Chlordane plus 5% DDT.
1.5% Dieldrin plus 5% DDT.

These dust formulations gave good control in 1951—but have not been proven effective under conditions existing in 1950.

See chart for timing and amount to use.

CAUTION: Aldrin, Chlordane and Dieldrin should always be used with DDT to prevent a bollworm build up. **EXTREME CARE SHOULD BE USED IN HANDLING ALL OF THESE MATERIALS.**

How And When to Dust Cotton

Dust insecticides may be applied at any time of the day or night when the air is calm. Dust can be applied with any type of ground equipment such as hand dusters, cultivator attached duster, cart dusters on which the power is generated by a small motor, and by power take-off dusters. There is a type of duster to meet the needs of the individual farmer. Most of the ground dusting during the past few years has been done by power take-off dusters which dusts from 40 to 8 rows at a time.

If dust is applied by an airplane, the plane must be flown just above the cotton plants and the swaths should not be wider than the wing spread of the plane, which is usually 30 to 40 feet. The farmer should always furnish a spotter for the planes so that the pilot will know just where to make each flight through the field. Do not permit pilots to dump large quantities of dust on a few rows in the field and make wide swaths, for the control will be very disappointing.

How And When to Spray Cotton

Three years of testing by the Oklahoma Experiment Station have shown that boll weevils, bollworms, leafworms, and thrips can be successfully controlled by spraying as well as by dusting. In these tests, emulsifiable concentrates were used in low gallonage and low pressure sprayers.

The following spray formulations have given good control under Oklahoma conditions:

Toxaphene-DDT Spray; Toxaphene Spray; B.H.C.-DDT Spray; Aldrin-DDT Spray; Dieldrin-DDT Spray; Chlordane-DDT Spray; Heptachlor; DDT Spray.

See spray chart for timing of sprays and amount of actual chemical to be applied per acre. For effective control, it is necessary to apply the correct amount of actual chemical per acre at the right time.

The amount of diluted spray applied per acre will vary with the kind of sprayer used, the type of nozzle, the size of the opening in the nozzle, and the number of nozzles used per row. The pressure and speed of the tractor also govern the amount used per acre.

One nozzle per row is sufficient in small cotton before it starts to set squares. Use two nozzles per row on medium sized cotton up to 18 inches tall. Use three nozzles per row in tall, rank cotton. When using one nozzle, set it 6 or 8 inches above the tops of the plants so that the spray will completely envelop the plants. When using two nozzles per row set them so as to direct two cones of spray towards the sides of the plants. When using three nozzles per row on larger plants, have the third nozzle set so as to direct a cone of spray downward to cover the tops of the plants. Widen the angle of the two lateral nozzles so as to obtain as much plant coverage as possible.

Nozzles such as used in spraying orchards are not recommended because they use too much spray.

Some difficulties may be experienced in spraying rank cotton where it laps across the rows and the foliage and limbs come in contact with the spray nozzles. See spray chart for timing sprays, and amount to use per acre.

CAUTION: 2-4-D is very toxic to the cotton plant and no ground sprayer or airplane that has been used in applying 2-4-D should be used in the cotton field.

How to Determine When to Begin Treatment

• **For Pre-Square Treatment**—Examine all plants on 100 linear feet of row.

The row should be selected near the center of the field and plants examined at three points in the row. These points should be near each end of the field and in the middle.

When one or more weevils are found in this space, pre-square applications should be applied.

• **For Square Protection**—To determine the number of punctured squares, walk diagonally across the center of the field, picking 100 squares as you walk. These squares should be half grown or larger and an equal number should be picked from the top, middle and lower branches of the plants. After picking 100 squares examine them for weevil injury. Record both egg punctures and feeding punctures as damaged squares. The number of squares damaged will give you the percentage of infestation when 100 squares are examined at each point. When 10 squares out of each 100 are punctured, treatment should begin and continue at 5-day intervals until infestation is reduced below 10 percent.

Thirty days should elapse between the time of the last early application of the insecticide and the time that bollworms normally make their appearance. Often times when early applications are not discontinued thirty days before the normal appearance of bollworms, bollworms may appear in damaging numbers and the cotton farmer may have to fight them all summer. The reason for this is that the organic insecticides kill off many of their natural enemies. By allowing a period of thirty days between the last early treatment and the time that the bollworm usually appears, the natural enemies of the bollworm will build up and help in controlling them.

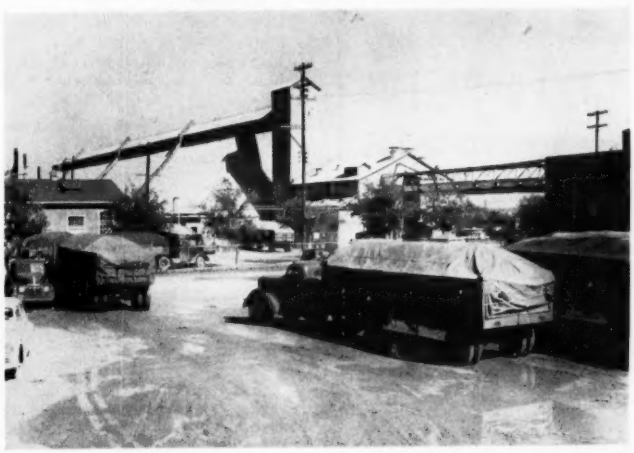
Where the rate of application varies, for instance, from one pound to one and one-half pound, the lesser amounts are for small cotton and when insects are not very numerous. The larger amounts are for larger cotton and when insects are numerous.

The Pink Bollworm Situation

Pink bollworms were found in Oklahoma during the 1951 gin trash survey in two previously uninfested counties. These counties were McClain and Grady, worms being found at Wayne in McClain County and at Pocasset in Grady County. Pink bollworms were also found in Caddo and Kiowa counties, two of the counties in which pink bollworms have been found before. The following counties are now under pink bollworm quarantine: Stephens, Jefferson, Cotton, Caddo, Kiowa, Tillman, Jackson, Harmon, Greer, Beckham, Washita, Comanche, McClain, and Grady.

So far, no pink bollworms have been detected in any of the fields of growing cotton, and it is hoped that they never will become numerous enough to

In '52: Save the Bolls – Produce the Bales



THE FARMER has got to produce the seed before the oil mill gets a pound to crush.

require the use of insecticides for their control. Farmers are urged to cooperate in carrying out the quarantine regulations. No cotton seed should be shipped out of the quarantined areas into pink bollworm-free areas.

1952 Cotton Insect Control Recommendations for:

South Carolina

INSECT CONTROL

1. Use a recommended pesticide.
2. Proper timing, a sufficient number of applications, and thorough coverage is essential for effective insect control.
3. Rotation, good cultural practices, defoliation and early stalk destruction are important aids for control of both insects and diseases.

Following are the recommendations for cotton insect control for South Carolina during 1952.

I. COTTON PEST CONTROLS FOR 1952

A. What to Use

The recommended insecticides and miticides for use in South Carolina during 1952, together with the pests they control, are listed below:

Aldrin—Boll weevil, thrips, cotton fleahopper.

Aramite—Spider mites.

BHC—Boll weevil, thrips, cotton fleahopper, cotton aphid.

DDT—Thrips, cotton fleahopper, bollworm.

Dieldrin — Boll weevil, thrips, cotton fleahopper.

Heptachlor—Boll weevil, thrips, cotton fleahopper.

Parathion—Cotton aphid, spider mites.

Sulfur — Cotton fleahopper, spider mites.

TEPP—Cotton aphid, spider mites.

Toxaphene—Boll weevil, thrips, cotton fleahopper, small bollworms; will suppress cotton aphids but will not control heavy infestations.

Other insecticides: 1-1-1 Mixture — Boll weevil and early infestations of bollworms.

B. When to Use It

• **Pre-Square Control**—If thrips or boll weevils are damaging seedling cotton, make two applications at weekly intervals, beginning: for thrips control, when first true leaves appear; for boll weevil control, when buds of plants are severely attacked. This will prove profitable by allowing the plants to grow more rapidly and thereby produce an earlier crop.

• **Pre-Bloom Period or Early-Season Control** — In areas where boll weevils cause damage every year, three weekly applications beginning as soon as the first square is seen, will destroy many of the over-wintering weevils, protect the early set of bolls and delay the normal weevil build-up.

• **Blooming Period or Mid-Season Control**—When first blooms are seen, make three applications at weekly intervals. This series of applications should protect your cotton until migration begins. All insecticides used during this period, except toxaphene, should include ½ pound of technical DDT per acre per application for bollworm control.

• **Maturing Period or Late-Season Control** — When 10% of the squares are punctured or migration begins, whichever occurs first, make three or more applications at 4-day intervals to protect all bolls less than three weeks old. All insecticides used during this period, with the exception of toxaphene, should include one pound of technical DDT per acre per application for bollworm control. One-half pound of technical DDT per acre per application added to toxaphene during this period will give added protection against bollworm injury.

D. How to Make Boll Weevil Infestation Counts

The life history of the boll weevil and the fruiting habits of the cotton plant indicate that continuity of poisoning application is essential. Any particular schedule of applications will not be suitable to all situations. Local insect infestations, stage of development of the cotton plant and weather conditions are vital factors in fixing these schedules of applications on any farm. Therefore, it is up to the individual farmer to gain a fuller knowledge of his own insect problems. One way to do this is by making weekly field observations to determine what insects are present, and, in the case of boll weevils, what the infestation percentage is.

A simple and accurate method of making boll weevil infestation counts is to walk diagonally across a field, picking 100 squares at random from the top, middle and lower branches of cotton plant. Count both egg laying and feeding punctures as punctured squares. The number of punctured squares found gives the percentage of infestation by boll weevils in that field. Make one such count for each ten acres of cotton.

E. Build-Ups and Outbreaks Requiring Emergency Measures

• **Thrips**—The first evidence of thrips injury on seedling cotton is a "silvering" on the underside of the leaves. Later stages of this injury can be recognized by the puckering of the leaves. This is sometimes referred to as "possum-eared" cotton.

• **Aphids**—The first evidence of cotton aphid or "lice" injury is a deforming or stunting of the plant leaves. This insect secretes a substance known as "honeydew" which may be seen on the leaves and later on the lint.

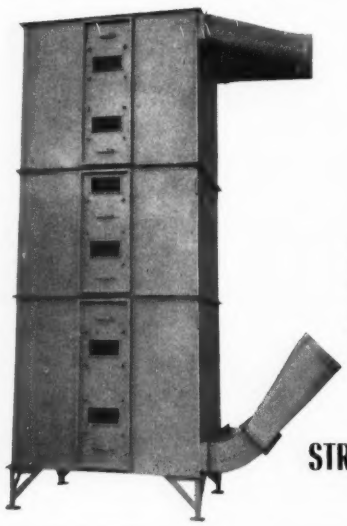
• **Bollworms**—Bollworm outbreaks may occur at any time during the cotton growing season. Normally outbreaks prior to the beginning of the blooming period are not serious. Build-ups or outbreaks after that time can greatly reduce yields. A bollworm threat can be detected by weekly examinations of a representative

STEEL HAND TRUCKS

For Gins, Oil Mills and Compress Operations

LONG REACH MACHINE WORKS

P. O. Box 2621
HOUSTON, TEXAS



"Government Type"
TOWER DRIERS

THE BEST WAY TO DRY COTTON—WITH MINIMUM INVESTMENT

Many pleased users of our substantial, well designed towers, prove their efficiency. Units, 10 to 24 shelves. Cross blow-boxes. Blow-box separators. Gas heaters. Air pipe and fittings.

LET US PLAN YOUR INSTALLATION IN TEXAS

STRICKLAND & HENDERSON

13-A Hackberry St.
Tel. 2-8141 P. O. Box 703
WACO, TEXAS

number of terminal buds for eggs and small worms (newly hatched larvae). The majority of the eggs and small worms can be found on the stems and leaves of the top 3 or 4 inches of the tender terminal growth. The eggs are creamy white in color and are about ¼ to ½ the size of the head of an ordinary straight pin. Begin control measures as soon as eggs and small worms are found.

• **Red Spiders and Spider Mites**—These pests are usually associated with hot, dry weather conditions. If allowed to go unchecked they can completely defoliate the cotton plant. The presence of fine webs and small reddish or yellowish spiders on the underside of the leaves indicate their presence. The first noticeable injury to the leaves is a mottling on the upper side. This is often called "rust."

F. Pesticides for Emergency Controls

• **Aramite** — For controlling outbreaks of red spiders or spider mites, use either 10 pounds of 4% Aramite dust or 2 pints of an Aramite concenrtate containing 2 pounds of technical Aramite per gallon. Use this amount per acre per application. Usually two weekly applications will be sufficient.

• **BHC** — For controlling build-ups of aphids, use 15 pounds of 3% BHC dust per acre per application, or its equivalent in a BHC spray. Make weekly applications.

• **DDT** — For controlling build-ups or outbreaks of bollworms, use 15 pounds per acre per application of any recommended dust containing 10% DDT or 15 pounds of 10% DDT alone, or add 1.0 to 1.5 pounds of technical DDT per acre per application to the liquid insecticide being used. Make applications at 5-day intervals.

• **Parathion** — For controlling either aphids, red spiders or spider mites, use 10 pounds of 1% parathion dust per acre per application. Make weekly application. Bollworms may build-up following the use of parathion. The use of this chemical is not recommended where the rotary type hand duster is to be used. Parathion and TEPP are recommended only when the special chemical mask designed for their use is worn by the operator.

• **TEPP**—For controlling either aphids, red spiders or spider mites, use ½ pint of 40% TEPP per acre per application. Make weekly applications. This chemical is recommended only when the special chemical mask designed for its use is worn by the operator.

• **Sulfur**—For controlling red spiders or spider mites, use 20 pounds of dusting sulfur per acre per application. Make weekly applications.

G. Dusts and Dusting Equipment

When dusting always use a respirtor. See special precautions for the use of masks when applying parathion. Avoid unnecessary skin contact with any insecticide. Become familiar with first-aid measures relative to the chemical being used.

Do not put dust into hopper until ready to start application. All dusts have a tendency to settle toward bottom of hopper and become packed. When this happens, uneven distribution of dust will occur when duster is started.

Always keep lid on duster closed tightly when not in use. This will aid in keep-

TRY IT—FREE

The New
1 h.p. 2-Speed

ACE GIN BLOWER

To prove that the ACE Gin Blower

Cleans faster and better
Reduces fire hazards
Prevents overheating
Saves time and labor

We will send one for FREE TRIAL.

Write for details. No obligation.

The Ace Co.

114 W. Washington St., Ocala, Fla.

INSECTICIDE TESTING

Complete
Analytical Service
On All Types of
Insecticides

COMMERCIAL TESTING LABORATORIES

P. O. Box 1906 Ft. Worth, Texas

The Millers Mutual

Fire Insurance Company of Texas

Fort Worth, Texas

INSURES COTTON GINS IN
TEXAS, OKLAHOMA, LOUISIANA & ARKANSAS

Fire & Extended Coverage or Windstorm & Hail

Sound Protection at Lower Cost

BENZENE HEXACHLORIDE

(TECHNICAL)

"ETHYL" (TRADE-MARK) BENZENE HEXACHLORIDE TECHNICAL ETHYL CORPORATION

12-14% GAMMA

FINELY FLAKED

Manufactured at Baton Rouge, Louisiana

ETHYL CORPORATION

100 Park Avenue Building New York 17, N. Y.

ing out moisture which can cause a stoppage or faulty distribution during next operation.

A heavy dew is not essential for satisfactory dusting conditions but the atmosphere must be calm. Dusting conditions are usually best during the hours from 5:00 P.M. to 9:00 A.M. Do not dust if wind is over 3 miles per hour. Do not depend on drift of dust from one row to another to control insects. If rain occurs within 24 hours after dusting, repeat application within 48 hours.

A rotary hand duster will care for five acres of cotton. A two-row, animal-drawn, traction duster will be adequate for from 20 to 30 acres. Larger acreages can best be cared for by high clearance, mule-drawn, traction dusters or tractor mounted dusters covering 4 to 6 rows at a time or by airplanes. Airplane dusters should not attempt to cover a swath greater than their wing span. When airplanes are used, flagmen should be used to mark areas already covered.

H. Emulsifiable Concentrates and Spraying Equipment

Insecticides sold in liquid form are called emulsifiable concentrates. They generally are prepared by dissolving one or more chemicals or "toxicants" in suitable solvents. To this are added other chemicals called "emulsifiers" which will cause the mixture to mix easily with water. When water is added to spray concentrates, most of them will form a white to cream-colored emulsion. After an emulsion has been applied by spraying, the water and certain parts of the emulsion evaporate or dry. This drying process "breaks" the emulsion and deposits on the foliage the toxic chemical and other parts of the mixture. The deposit of insecticide from a spray is very adhesive and is not easily removed by rain.

Sprays should be applied only when the plants are dry. Do not spray cotton that is wet with either dew or rain. Sprays can be effectively applied in winds up to 10 miles per hour. It is recommended that sprays be applied only with mechanical equipment that will prevent the spray drift from coming in contact with the operator.

Spraying equipment in which 2,4-D has been used must not be used to apply insecticides to cotton.

The simplest method of determining the number of gallons of spray applied per acre is to fill the spray tank up to the filling spout. Start pump and set regulator at specified pressure. Spray a measured acre at your normal operating speed. Stop spray machine and measure the amount of water needed to refill tank to filling spout.

Another method of determining the number of gallons of spray applied per acre is to attach a quart fruit jar to one of the nozzles. This can be done by cutting a small hole in jar top, inserting shank of nozzle and screwing nozzle tip on underside of jar top. Now screw jar top onto jar. Be sure to make a small air hole in jar top so spray will enter jar. Pour several gallons of water into spray tank. Start pump and set regulator at specified pressure. Spray at your normal operating speed until jar is full. Stop sprayer and measure acreage covered. Multiply number of nozzles being used by the amount of spray (one quart) caught in jar. This will give you the total amount of spray being applied to the acreage covered.

To calculate dosage in filling spray tank, multiply number of acres covered by one tankful (as determined above) by the number of pints of insecticide recommended per acre. Mix this total amount of insecticide with an equal amount of clean water and pour into tank. Add water until tank is full. Change the amount of insecticide when it is found that more or less acres are being covered per tankful.

The water used for diluting the spray should be perfectly clean. This is necessary because small trash or mud in the water will produce unnecessary wear on the pump and continually cause clogging of the nozzles, resulting in inefficient spraying and loss of time. The best source is from a closed water system. Under no circumstances should muddy water be used. Where creek or pond water must be used, oversized filters are commercially available for clarifying such water.

The emulsion concentrate should not

Quotes From Our Authors:

"AS A community leader, business man, and in many cases as a farmer, the ginner is one of the most powerful influences toward agricultural betterment in the area in which he lives."

New Belcot Nylon Press Cloth Outlasts Wool Cloth Several Times

The new Belcot Nylon Press Cloth is stronger and thinner than ordinary wool press cloth. It will outwear wool cloth several times. Because this Nylon Press Cloth is thinner, you can use a larger cake and get more production from the presses.

Order your new Belcot Nylon Press Cloth now!

"BUILT TO STAND THE PRESSURE"

BELTON BAGGING CO.

Belton, South Carolina

Now you can fasten V-belts by using

ALLIGATOR

V-BELT FASTENERS

Alligator V-Belt Fasteners and the open end (long length) V-Belting, in rolls, are now being used by the cotton gin manufacturers on their new gins as original equipment.

Replacement parts can be obtained from your cotton gin manufacturer or your local supply house.

Bulletin V-211 gives complete details. A copy mailed on request.

Flexible Steel Lacing Company

4632 Lexington St., Chicago 44, Illinois

Also sole manufacturers of Alligator Steel Belt Lacing for flat conveyor and transmission belts and FLEXCO Belt Fasteners and Rip Plates for fastening and repairing conveyor belts.

be diluted with water until spraying is started. Pour the required amount of spray concentrate into a suitable container and add an equal amount of water. This is called the "pre-dilution." Stir thoroughly until the mixture is creamy white. Pour this mixture into the spray tank and add the required amount of water necessary to cover the desired acreage. Start pump and agitate the finished spray for at least two minutes by pumping back through the overflow into tank. Do not add the spray concentrate directly to tank without predilution.

The diluted or emulsified insecticide must remain stable; that is, the oil must not separate from the water. If this happens the concentrate should be discarded or exchanged for another brand which will "hold," for a "broken" emulsion is not only ineffective but will seriously damage cotton foliage. If spraying operations are interrupted while there is still spray material in the tank, this material should be thoroughly agitated before resuming operation. This can be done by recirculation with the pump for a few minutes before continuing operation.

CAUTION: Liquid insecticide concentrates spilled on skin or clothing is extremely dangerous. Immediately remove clothing and bathe thoroughly with plenty of soap and water.

Results obtained from the use of the small hand, pump-up garden sprayer in 1951 indicated that it can be satisfactorily and economically used by the small cotton farmer on acreages up to about 10 acres. It can be arranged to handle from one to three nozzles per row by the addition of booms and nozzles included in the original kit. It can be carried on the back of the operator, slung over the horn of a saddle with the operator riding on the mule's back or this sprayer can be rigged for use on riding or walking cultivators or on tractors. This sprayer has a capacity of from 3 to 4 gallons and when carried on the operator's back, demonstrations have shown the average grower can cover one acre per hour.

When buying the small hand sprayer it is advised to also buy a few spare parts for use as replacements in case of a breakdown during operation. Most needed parts are: pump washers, cut-off valves, hose clamps and the seal for top of tank.

A two- to six-row, low-gallonage sprayer, mounted on tractor or animal-drawn equipment has been found satisfactory for cotton spraying. On very hilly land it is advisable to use equipment covering only 2 to 4 rows.

The mule-drawn, traction sprayer, commonly used for spraying tobacco can be used for applying emulsifiable concentrates, provided it is equipped with low-gallonage nozzles. These nozzles are available within the state. If emulsifiable concentrates are used with this type sprayer, protective shields should be mounted on them to prevent the spray drift from coming in contact with the operator.

It has been found through experience that the use of galvanized pipe is quite satisfactory for one season's use as a boom or drop. Regular rubber garden hose can also be used for one season's operation.

The use of rubber or neoprene hose for drops without metal reinforcements has been found to be not as satisfactory as metal tubing. (The drops carry the spray from the distribution boom to the nozzles).

Airplane sprayers should not attempt to cover a swath greater than their wing span. When airplanes are used, flagmen should be used to mark areas already sprayed.

Suggestions on spraying equipment:

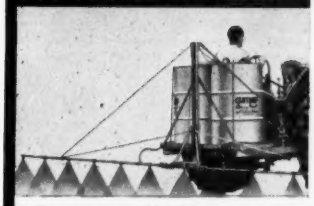
Spray pump—For tractor-mounted sprayers, the spray pump should be of the power take-off type, with an efficient delivery of 540 r.p.m. Pumps with a sleeve to slide over the standard power shaft provide an easy and quick means of attachment. By-pass and pressure regulator valves are essential to maintain the desired constant pressure.

For gasoline-powered pumps (auxiliary engine-driven pumps as used on animal-drawn spray rigs) it has been found that a jack-shaft with a flexible coupling between the shaft and the pump will avoid excessive leaking at the pump packing gland. These pumps should have the same capacity and other features as power take-off driven pumps.

Spray nozzles—A nozzle of the hollow cone type is best suited for spraying cotton. The equipment should be operated at the manufacturer's specified pressure.

Spray nozzle operation—Maintain nozzle direction and adjustment to manufacturer's specified distance from foliage.

CENTURY
introduces
NEW, LOW-COST
SPRAYER



Century's new "A-1" sprayer — easy to operate, built for years of dependable service.

Mounts on most tractors
Complete tractor-seat control
Up to 110 gal. capacity
Adjustable row spacing
Full coverage, 6 or 8 rows

List, f.o.b. factory—only $163.50
For Ford or Ferguson — $141.50

For complete information on the profit-building Century Sprayer line, write your nearest distributor TODAY for FREE catalogue.

R. C. CROPPER COMPANY
Macon, Georgia
SERVIS EQUIPMENT CO.
Dallas 1, Texas
STRATTON-BALDWIN CO., INC.
New Orleans 9, Louisiana
STRATTON-WARREN HDWE. CO.
Memphis 2, Tennessee
JOB P. WYATT & SONS CO.
Raleigh, North Carolina

CENTURY
ENGINEERING CORPORATION
Farm Equip. Div. Cedar Rapids, Iowa

WATSON
FINEST
COTTON
MONEY CAN BUY

The tremendous popularity of Watson cotton has made it impossible to supply all of our fine friends who would like to plant this high yielding, profit-making cotton. If you are not able to get Watson cotton this year, make it a point to get your order in early for next season because it is the most profitable cotton you can plant.

3 Great Varieties to choose from
• WATSON COTTON
• WATSON'S NEW ROWDEN
• WATSON'S STONEVILLE 62

FERRIS WATSON SEED CO.
GARLAND • Dallas County • TEXAS

In most cases this is from 8 to 10 inches from the plant. Check this distance after each round and see that nozzles are functioning properly at the manufacturer's specified pressure.

Nozzles per row—The number of nozzles needed for good coverage will vary with the size of the cotton plant and the terrain being covered. The spraying of cotton on hilly, terraced rows should begin with two nozzles per row and be changed to three nozzles per row when the first blooms are seen. In areas where fields are flat and rows are straight, it should be possible to get good coverage with one nozzle per row until the first blooms are seen. At that time a change to two nozzles per row would be necessary, and, for late-season control, the use of three nozzles per row will prove satisfactory.

Strainers—Strainers are an important part of low-gallonage spray equipment. The inlet or suction hose should be equipped with a strainer to prevent any foreign material from entering the pump. This should eliminate a large percentage of stoppages at both pump and nozzles. The pump and nozzles should also be provided with strainers and filters. Regardless of the care exercised to prevent nozzles stoppages, some will occur.

It has been found that stoppages are reduced to a minimum when 100 mesh strainers are used on the suction hose and 200 mesh strainers used at pump and nozzles. Extra nozzles should be provided in order to make a quick change in the field without losing time to clean a plugged one.

Care of sprayer—Care should be exercised in cleaning the entire machine. It is a good practice to run clear water through the system for several minutes at the end of each day's operation. Nozzle tips are made of soft material and are easily damaged. If hard objects are used for cleaning tips, the orifice will probably be altered in both size and shape. This will result in varying both the spray pattern and the rate of application. Nozzles may be cleaned by washing in water or fuel oil or by using compressed air. Never use an object harder than a horse hair for probing into the orifice of the nozzles.

I. Wettable Powders and Their Use

The wettable powders are mixtures that contain certain chemicals called "wetting agents." These insecticides are mixed with water and applied with high-gallonage spraying equipment. The use of wettable powders in low-gallonage equipment will cause clogging of the strainers and nozzles. Regular cotton dusts cannot be satisfactorily used in either high- or low-gallonage sprayers for the same reason.

The mule-drawn, traction sprayer, commonly used for spraying tobacco, is used in some sections of the state for spraying cotton. The wettable powders are usually used in this machine. It will deliver about 15 gallons of liquid per acre with one nozzle per row and about 50 gallons per acre with three nozzles per row. If this type of machine is used, it is suggested that a 50 mesh screen strainer be used.

Mixing wettable powders—To about five gallons of water in a 55-gallon drum add the desired amount of wettable powder. Mix thoroughly. To this add remainder of water necessary to give recommended rate of spray per acre. Stir thoroughly. Transfer this mixture into spray tank. Refill spray tank as needed from this prepared mixture. Always stir thoroughly before transfer as the powder will tend to settle to the bottom of the tank.

J. 1-1-1 Mixture

The 1-1-1 mixture is still used in some sections of the state and has proven effective in boll weevil control. This mixture is composed of 1 pound of calcium arsenate, 1 gallon of molasses and 1 gallon of water. Calcium arsenate is a good boll weevil poison but it is not effective against other cotton pests such as thrips, cotton fleahoppers, aphids and red spiders or spider mites. Because of this, it is not comparable with the all-around insect control made possible with the use of the newer organic insecticides.

When the 1-1-1 mixture is used for early-season boll weevil control, the use of an organic insecticide is recommended

South Carolina Recommendations

C. How Much to Use

RECOMMENDED DUSTS

TIME OF APPLICATION	POUNDS P/A	DUST FORMULATIONS
Pre-Square Control and Pre-Bloom Period (Early-Season Control)	6-8	2½% Aldrin (2½-0-0) 3% BHC (3-0-0) 1½% Dieldrin (1½-0-0) 2½% Heptachlor (2½-0-0) 20% Toxaphene (20-0-0)
Blooming Period (Mid-Season Control) See footnote below.	10-12	2½% Aldrin-5% DDT (2½-5-0) 3% BHC-5% DDT (3-5-0) 1½% Dieldrin-5% DDT (1½-5-0) 2½% Heptachlor-5% DDT (2½-5-0) 20% Toxaphene (20-0-0)
Maturing Period (Late-Season Control)	12-15	2½% Aldrin-10% DDT (2½-10-0) 3% BHC-10% DDT (3-10-0) 1½% Dieldrin-10% DDT (1½-10-0) 2½% Heptachlor-10% DDT (2½-10-0) 20% Toxaphene-5% DDT (20-5-0)

If only one dust formulation is to be bought, it is recommended that the dust be selected from the Mid-season group. These are the standard dust mixtures for South Carolina.

South Carolina Recommendations

RECOMMENDED SPRAYS (Pounds of toxicant per gal.)

Time of Application	Aldrin		BHC		Dieldrin	Heptachlor	Toxaphene		DDT*	
	2.0	0.8	1.2	1.6	1.5	2.0	6.0	8.0	2.0	3.0
	Pints to use per acre									
Pre-Square Control	½	1½	1	¾	½	½	1½	1		
Pre-Bloom Early-Season Control	¾	2	1¼	1	½	¾	2	1½		
Blooming Period Mid-Season Control	1	3	2	1½	¾	1	3	2	2	1⅔
Maturing Period Late-Season Control	1½	4	2½	2	1	1½	3½	2½	4	3⅓

RECOMMENDED WETTABLE POWDERS (Percent dusts)

Time of Application	Aldrin	BHC		Dieldrin	Heptachlor	Toxaphene	DDT*	
	25%	10%	12%	25%	50%	40%	50%	75%
	Ounces to use per acre							
Pre-Square Control	8	24	20	5	4	40		
Pre-Bloom Early-Season Control	12	36	30	8	6	60		
Blooming Period Mid-Season Control	16	48	40	10	8	80	16	11
Maturing Period Late-Season Control	24	64	60	15	12	120	32	22

*For bollworm control during Mid-Season, add ½ lb. technical DDT, and during Late-Season, add 1 lb. technical DDT per acre per application to each of the above materials, with the exception of toxaphene. If the dust or concentrate being used already contains this amount of DDT, additional DDT need not be added. One-half pound of technical DDT per acre per application applied with toxaphene during Late-Season gives added protection against bollworm injury.

during the blooming and maturing periods.

K. General Information

For complete seasonal cotton pest control, follow either the dusting or spraying schedule which includes nine or more applications. Comparable results can be obtained by the use of either dusts or sprays.

The uniformity of applications of any insecticide is largely dependent upon a constant rate of travel. A convenient rate of speed should be selected and then maintained. In spraying, slight variations in pump pressure can determine the desired flow of spray.

Bug-catching machines are not recommended for cotton insect control.

The use of fenders on wheeled equipment during Late-Season operations will reduce the number of bruised or crushed bolls. Plans are available for home-constructed fenders.

L. Precautions

All of the cotton pesticides recommended herein are poisonous to man and animals and because of this they should be used with appropriate precautions.

Parathion and TEPP are highly poisonous to human beings if inhaled, absorbed through the skin or swallowed. Repeated inhalation or skin contact (even in small amounts) may progressively increase susceptibility to parathion or TEPP poisoning, without giving rise to symptoms. Extreme care must therefore be exercised at all times in handling these products. These materials are not recommended for use in South Carolina unless the special chemical mask designed for their use is worn by the operator. Do not apply these chemicals under conditions where the drift will be carried into dwellings.

Liquid insecticides spilled on skin or clothing is extremely dangerous. Immediately remove clothing and bathe thoroughly with plenty of soapy water.

Users and handlers of insecticides should be thoroughly familiar with the various hazards and should take proper precautions in formulating, packaging, labeling and in the application of pesticides.

Persons engaged in poisoning operations should wear a respirator as a protection against inhaling these poisonous particles. Loading and mixing should always be done in the open. Avoid unnecessary skin contact with these materials.

All empty paper or cardboard containers in which insecticide dusts have been packaged should be ripped open and burned or otherwise destroyed as soon as possible. If metal or glass containers are to be saved, they should be thoroughly washed and cleaned immediately after emptying. Never use such containers for feeding or watering livestock.

The insecticides should always be identified by label and stored in a place where they are inaccessible to irresponsible persons and animals. Poisoning operations should be done under such conditions and in such a manner as to avoid excessive drift onto adjacent fields where animals are pastured or where food crops are grown.

As soon as possible after poisoning operations are concluded, the operator should remove clothes contaminated with the insecticides and should bathe.

Insecticides destroy beneficial as well as injurious insects. Care should be exercised to avoid poisoning honey bees through careless use of insecticides. Whenever possible, nearby beekeepers

FINEST QUALITY DUST IN THE SOUTH

Tri-States Brand Cotton and Peanut Insecticides Give Results!

Tri-Tox-S (Toxaphene)	20-40 (20% Toxaphene, 40% Sulphur)
Tri-Tox-T (Toxaphene)	20-0 (20% Toxaphene)
Tri-3-5-40 (BHC)	3-5-40 (3% BHC, 5% DDT, 40% Sulphur)
Tri-3-5-0 (BHC)	3-5-0 (3% BHC, 5% DDT)
Tri-3-10-40 (BHC)	3-10-40 (3% BHC, 10% DDT, 40% Sulphur)
Tri-3-10-0 (BHC)	3-10-0 (3% BHC, 10% DDT)

Also complete line of Peanut Dusts:

SULPHUR - COPPER - DDT MIXTURES

For Information and Prices, Write or Call:

GREENWOOD PRODUCTS COMPANY, Graceville, Florida
TAYLOR OIL & PEANUT MILLS, Moultrie, Georgia

Manufactured For:

GEORGIA PEANUT COMPANY
Moultrie, Georgia

141- and 176-Saw
Change-Over Equipment

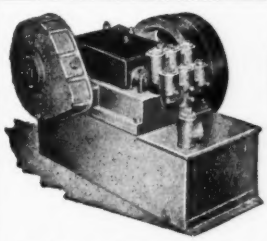
BUTTERS IMPROVED AUTOMATIC LINTER
SAW SHARPENING MACHINES FOR 141 OR 176 SAWS

Produces More Lint Cut Per Saw

LINTER SAWS . . . DROP-FORGED STEEL RIB GRATE FALLS . . .
STEEL RAKE HEADS . . . SAW MANDRELS . . . BALL
BEARINGS . . . FLOATS . . . ALUMINUM SPACE BLOCKS

PERMANENT MAGNET BOARDS

BUTTERS MANUFACTURING CO.
ATLANTA, GA.



ALAMO
GINPRESS
HYDRAULIC PUMP

Efficiently fills needs of the gin and oil mill. Large capacity, low operating and maintenance costs at comparatively low price. Drives direct from electric motor or line shaft.

For full data ask your dealer or address the

ALAMO IRON WORKS

San Antonio - Houston - Brownsville
Corpus Christi - San Angelo

ORIENTAL GASKET & PACKING CO.

Manufacturers of All Industrial Gaskets

Belting, Crimps, Packing, Belt
Cements, Hooks, and Dressings

2612-14 Commerce St. Phone: RIverside 9874 Dallas 1, Texas

BRING YOUR EQUIPMENT Problems TO US!

Over 30 years of serving the Cotton Gins and Oil Mills of the South has only increased our desire to serve you better. Whatever you may need for your plant, anything from a stove bolt to Howe Motor Truck Scales, just write, wire or phone and your order will receive prompt, friendly attention.

WELL MACHINERY & SUPPLY CO. Inc.
1629 MAIN ST. FORT WORTH

IT PAYS TO PLANT

PAULA

The Balanced Cotton

Originated, Developed, and Bred by

DEERING FARMS, INC.

Sales Office at

511 KENNETT ST., KENNETT, MISSOURI

Quotes From Our Authors:

"MORE PROGRESS was made in controlling the major cotton insects during the last 5 or 6 years than during all previous years."

should be notified before applications of any insecticide.

Spillage of insecticides where they might drain into water used by man or livestock should be avoided. The dumping of any poisons even in small amounts near sources of water supplies should be avoided. Certain of these materials are highly toxic to various forms of aquatic life. It is especially necessary to use minimum amounts in cases where there would be an unavoidable drift to ponds or streams stocked with fish.

Experience to date indicates little immediate toxic effects on plants from the use of the organic poisons recommended herein, but there is a definite possibility that over a period of time, toxic quantities may accumulate. This matter is being continually investigated.

Cotton Insecticides in Soils: When the recommended cotton insecticides are used at the specified rates per acre, the amounts used are not sufficient to be hazardous to South Carolina soils. A part of these insecticides used goes to the soil where it may gradually break down or be lost through erosion and leaching. Experiments demonstrate that BHC in the soil may impart an off-flavor to white potatoes grown in the same soil at a later date. To date, however, there is no evidence that peanuts will pick up an off-flavor in soils where cotton insecticides have been used. Therefore, to be safe in 1952, white potatoes should not be planted in cotton soils contaminated with BHC.

1952 Cotton Insect Control Recommendations for:

Tennessee

General Suggestions

Insecticides shortages are not as acute as in 1950; however the local dealer cannot possibly secure or carry in stock enough poison to fill all needs when every farmer waits until damage starts and then all want poison at once. Enough material for 4 or 5 applications should be on hand in advance of need.

The time of day will affect the value of applications of organic poisons. Late afternoon and evenings are the most desirable times for dust applications. Usually organic poison dusts should not be applied between 8 a.m. and 4 to 5:00 p.m., as rising currents and high temperatures will reduce their effectiveness. Dusts should not be applied during windy periods.

Sprays and dusts are equally effective when each has been applied properly. Sprays are cheaper and more satisfactory for early season applications, especially where spraying and cultivating can be done in one operation. Sprays can be applied over a wider range of conditions, with fairly strong winds or in the middle of the day. Sprays should be applied when the plants are dry. Spraying equipment is

more complicated than dusting. *Use fender guards on tractors for large cotton.*

In airplane dusting or spraying, the planes should fly about 5 feet above the cotton and not attempt to cover swaths greater than the wingspan of the plane. Flagging is desirable for dusting and absolutely necessary for spraying. For spraying, one to two gallons per acre is suggested; for dusting, 10 to 15 pounds.

Choice of insecticides presents no problem since several are effective. Success or failure of controls depends on proper application and timing. Rainy weather is an important factor to consider when applying insecticides. Aldrin and B.H.C. are quick-acting poisons and as such need not be repeated unless washed off under 12 hours. Toxaphene, dieldrin, and heptachlor are slower-acting and must remain on plants 24 hours.

• **Safety Measures**—All insecticides recommended for cotton insect control are poisonous and toxic to man. Insecticide containers should not be opened in closed rooms. Operators should avoid breathing all such materials. Rubber gloves and protective clothing should be worn when handling concentrates and the hands washed frequently. A bath and a complete change of clothes should follow any work in which the clothing becomes contaminated. Effective antidotes should be available for immediate use at all times. Read and follow all precautions as listed on labels by the manufacturers of each insecticide.

Treatments

1. Cutworms, Thrips, and Fleabeetles. Early poisoning for these pests will be generally needed throughout the state. The first application is recommended when the two seed leaves (cotyledons) unfold. Two effective applications at weekly intervals are recommended. These treatments prevent ragging and destruction of stands. Early applications get the cotton off to a good start and allow the crop to mature much earlier. Hibernating weevils, if present, will be controlled simultaneously.

2. Hibernating Boll Weevils, Fleahoppers, and Plant Bugs. The next applications should begin when the first square is seen (plant has 7 to 9 leaves). Two or three applications should be made at weekly intervals. These treatments are applied with a minimum of effort and material and are applied at height of of the fruiting period. These early treatments are recommended on the idea of setting a crop early and holding gains of early treatments above.

3. Summer and Late Season Control for Boll Weevil. Further poisoning should be based on **weekly square infestation counts.** This is the best way in which to determine weevil infestations: Pick 100 squares as you walk diagonally across the field from two directions, picking equally from top, middle, and lower limbs. The number of punctured squares out of each 100 squares picked is the percent infestation. **Squares should be picked from the plants only and not from the ground, and at random. No effort should be made to get punctured or non-punctured squares only.** In very large fields two or three such counts should be made.

Applications for boll weevil should be made at four- or five-day intervals, beginning when 10% to 15% of the squares are punctured and continuing,

Step Up Gin Press Production!

"SD" HYDRAULIC POWER UNITS

Cotton ginners find this smooth, fast performer more economical to operate their gin presses! Features self-enclosed design and a rotary type pump which is simply operated by push button! You are invited to write for further details.

STANDARD DESIGNERS INCORPORATED

12 BREVARD ROAD • ASHEVILLE, N. C.

THE *Finest* TELESCOPE EVER BUILT!

Runs on track—unloads long trucks or trailers without moving up.

Easy to Operate

Bronze Oil-Lite Bearings Throughout

Sturdy Construction

A Real Labor Saver

A PROVEN PRODUCT

Last season we were unable to supply the demand. We have a large supply on hand at the present time. But materials are getting scarce.

Better place your order now before it is too late.

•

The STACY COMPANY, Inc.

2704 TAYLOR ST. DALLAS 1, TEXAS

"THERMO-LAST"

NYLON PRESS CLOTHS

Cut Oil Extraction Costs

"THERMO-LAST" Nylon Press Cloths

- **Outlast old-type cloths**
- **Practically eliminate repair work**
- **Handle faster, easier**
- **Permit use of larger cake, more oil per pressing**

Other Nylon Advantages

Strong—Lightweight
Dimensional Stability
Low Moisture Absorption

SUMNER COMPANY

Mill and Offices, Columbia, South Carolina

Call our nearest representative

Robt. Burgher, Dallas, Tex. • Central Bag Co., Macon, Ga. • Mason Jackson Co., Shreveport, La.
Foreign Agent: M. Neumans & Son, Inc., 90 West Street, New York 6, N. Y.

BARCO

All Formulations
and
All Combinations of
Cotton Poisons

DDT	Aldrin
BHC	Dieldrin
Toxaphene	Parathion
Chlordane	Tepp
Heptachlor	Lindane

BARCO CHEMICALS, Inc.
67 Butner Street
DES MOINES 15, IOWA

SEEDBURO
739 Converse Building, Chicago 6, Illinois

Specialists
in Supplying You with
the Best Equipment
for
TESTING, GRADING
AND HANDLING
YOUR PRODUCTS

COTTON PLANTING SEED
Georgia Registered Purple Tag
EMPIRE WR
Wholesale Distributors West Mississippi River and Old Mexico
State Certified Blue Tag
EMPIRE WR DELTAPINE 15 DELTAPINE FOX
COKER 100 WILT STONEVILLE 2B
Write or Phone
ENGLAND PEDIGREED SEED COMPANY
Box 146 ENGLAND, ARKANSAS Phone 167

ANNOUNCING
The appointment of two industrial sales representatives
FOR WEST TEXAS AREA:
H. R. DOUGHTIE LUBBOCK, TEXAS
P. O. Box 416 Phone 2-1874
FOR LOUISIANA AND ARKANSAS AREA:
JORDAN BARTON MONROE, LOUISIANA
P. O. Box 1033 Phone 6630
"Electric Motor Sales and Repairs"
W. M. SMITH ELECTRIC COMPANY
P. O. Box 7775 DALLAS, TEXAS
P. O. Box 1972 HARLINGEN, TEXAS

if necessary, until bolls set are mature. During weevil migration (around August 15) it may be necessary to reduce the time between applications to three or four days and increase the amounts of insecticides. Control should be started during migration when 15% to 25% of the squares are punctured. If season is wet, start at 15%. Protect all bolls that will open, until they are at least three weeks old. Some of the most effective control gains can be made at this time.

Poisons for weevils must be applied regularly in sequential series to get results. Not less than three applications should be made in series. After one series of three applications, make further square counts to determine if further treatments are required.

4. Miscellaneous Treatments. Control materials and rates of application for red spider, yellow-striped armyworm, aphids, leafworm, and bollworm are given in the tables accompanying these recommendations.

Recommended Dust Insecticides

1. 3% Gamma Benzene Hexachloride (GBHC) Plus 5% DDT. This mixture will control practically all cotton insects when used at 10 pounds per acre. If bollworms become numerous, the rate may be increased to 15 pounds per acre if boll weevil is also a problem; otherwise, 10 to 15 pounds per acre of 10% DDT dust alone will control the bollworms. The 3-5 mixture is used most economically when alternated at four to five-day intervals with calcium arsenate at 7 to 10 pounds per acre.

2. Aldrin. A dust containing 2.5% aldrin at 10 pounds per acre will control the boll weevil, the cotton fleahopper, tarnished plant bug, rapid plant bug, and thrips. Thrips and fleahoppers may be controlled with as little as 5 to 8 pounds per acre. Generally, aphids do not build up following its use. Hatching leafworms are killed by it but it does not control large leafworms. Bollworms may be controlled by a mixture of 2½% aldrin and 5% DDT.

3. Toxaphene. A dust containing 20% toxaphene at 10 to 15 pounds per acre will control the boll weevil, fleahopper, thrips, grassworm, leafworm, cutworm, grasshoppers, and rapid and tarnished plant bugs. Toxaphene at 10 pounds per acre is fairly effective against moderate infestations of the bollworm; but in heavy infestations, increasing the dosage to 15 to 20 pounds per acre, or the addition of 5% DDT, is desirable. This heavy rate also will control the yellow-striped armyworm and garden webworm. Thrips and fleahoppers may be controlled with as little as 5 to 8 pounds 20% toxaphene per acre. The cotton aphid usually will not develop injurious infestations if toxaphene is used throughout the season.

4. Dieldrin. A dust containing 1½% dieldrin at 10 pounds per acre will control thrips, cutworms, the boll weevil, cotton fleahopper, tarnished plant bug and rapid plant bug. Thrips and fleahoppers may be controlled with as little as 5 to 8 pounds per acre. Aphids do not usually build up following its use. Bollworms, yellow-striped armyworms, and garden webworms may be controlled by a mixture of 1½% dieldrin and 5% DDT at 15 pounds per acre.

5. Calcium arsenate. This material is an economical and effective dust for use against the boll weevil, leafworm, and somewhat for bollworm. It is used

at the rate of 10 to 15 pounds per acre for boll weevil and leafworm, and 12 to 16 pounds for bollworms if infestations are not too heavy. Dust at 4 to 5 day intervals for boll weevil. The use of calcium arsenate often will cause aphids to increase; therefore, alternate applications of calcium arsenate must contain an aphicide.

6. Heptachlor. This is a new material this season. A dust containing 2½% heptachlor at 10 to 15 pounds per acre will control the boll weevil, plant bugs, cutworms, and garden webworms.

Recommended Liquid Insecticides

Emulsifiable concentrates of toxaphene, adlrin, dieldrin, benzene hexachloride (GBHC), heptaenlor, DDT, and combinations thereof, will be available in 1952 for use in sprayers. See control calendar for recommended rates of application. These materials must be diluted with water for use. The amount of spray solution required per acre will vary with the type, number of nozzles, speed of equipment, etc. Nozzles should be kept 6 to 8 inches from the plant to avoid leafburn. For safety, the spray boom on ground equipment must be located behind the operator. Small hollow cone nozzles should be used with an angle of spray of not more than 80 degrees. Tractor speed may vary 3 to 5 miles per hour, depending on equipment. Wettable dusts cannot be used in low-gallonage gear-pump sprayers, as nozzles will clog and pumps will wear out. Spray concentrate can be applied with water at rates of up to 10 gallons per nozzle per acre without dimunition of killing power, as long as the required poundage of actual insecticide is applied. See spray rate table for dilution of emulsion concentrates. See also U-T Circ. Inf. 80, "Construction High-Clearance Cotton Sprayer."

Spray Rate Table

This table applies when the application rate of diluted spray solution is one gallon per acre per nozzle.

Use one nozzle per row for cotton to 10 inches high, 2 nozzles for cotton 10 to 18 inches, 3 nozzles for cotton 18 inches and over.

Under column C in table, dilution rates for all applications (1, 2, or 3 nozzles) remain the same. Just by changing the number of nozzles per row (1, 2, and 3) as the crop develops, the reommended amounts of insecticide will be applied. If speed and pressure are varied, dilution rates must be adjusted accordingly. If nozzles applying two gallons per acre per nozzle are used, for example, the amount of water (column B) must be doubled.

The figures in column A in the table represent actual weight of technical insecticide in one gallon of concentrate. They are given on manufacturers' labels as the percentage of toxicant by weight in a gallon of concentrate, and are purchaseable as such.

To determine output of sprayer: Fill spray tank with a known amount of water, and spray a measured area at normal operating speed using the pressure recommended for the spray rig. Note time required to cover the area. Then measure amount of water required to refill spray tank to original level, and convert to an acre basis.

Pertinent Questions Often Asked About the Boll Weevil

Q. How long does a square remain on the plant after being punctured?

A. Average 7 days.

Q. What age squares do weevils prefer?

A. Squares 7 days old to 3 days before blooming.

Q. How old must a boll be before it is safe from weevil attack?

A. Approximately 20 days.

Q. How long will an overwintered boll weevil live if it emerges before the cotton is up?

A. Average 5.65 days, maximum 52 days, minimum 1 day.

Q. How long will an overwintered boll

Insecticides Recommendations for Tennessee

Columns	A	B	C			D		
Insecticide	Lbs. of Poison in Each Gallon Concentrate	Gals. Water to each Gal. Concentrate	Lbs. of Poison Applied per Acre by 1, 2, and 3 Nozzles			Acres Covered by 1, 2, and 3 Nozzles per Row		
			1	2	3	1	2	3
Aldrin	2.0	11	0.17	0.34	0.51	12	6	4
Dieldrin	1.5	8	0.15	0.30	0.45	9	4.5	3
DDT	2.0	11	0.17	0.34	0.51	12	6	4
DDT	2.0	5½	0.34	0.68	1.0	6	3	2
Gamma BHC	1.2	8	0.13	0.26	0.39	9	4.5	3
Gamma BHC	1.6	11	0.13	0.26	0.39	12	6	4
Heptachlor	2.0	7	0.25	0.50	0.75	8	4	2.6
Toxaphene	6.0	6.2	0.83	1.66	2.5	7.2	3.6	2.4
Toxaphene	8.0	8.6	0.83	1.66	2.5	9.6	4.8	3.2
TEPP	4.0	47	0.08	0.16	0.25	48	24	16

Tennessee's Cotton Insect Control for 1952

Cotton Insect Control Calendar

INSECTS	TREATMENT AND INTERVAL	DUSTS AND LBS. PER ACRE	SPRAYS AND NOZZLES PER ROW
		Early Season Control	
Cutworms	When worms appear, repeat as necessary.	10% DDT, 20% toxaphene, or 1.5% dieldrin—10 lbs.	Toxaphene, dieldrin or DDT. 1 nozzle.
Thrips, fleabeetles. (If aphids appear, see below.)	When 2 seed leaves spread. 2 applications at 7-day intervals.	20% toxaphene, 2½% aldrin, 1.5% dieldrin, 5% DDT or 3% GBHC, 2½% heptachlor, 5 lbs.	Toxaphene, dieldrin, aldrin, DDT, GBHC, heptachlor. 1 nozzle.
Hibernating boll weevil, fleahopper, tarnished and rapid plant bugs	At first squaring if insects present. 2 or 3 applications at weekly intervals.	20% toxaphene, 3% GBHC, 2½% aldrin, 1½% dieldrin, 2½% heptachlor 10 lbs. per acre.	Aldrin, dieldrin, GBHC, or toxaphene, heptachlor, 1 or 2 nozzles, depending on cotton size.
		Late Season Control	
Boll Weevil	10-15% infestation, 3 applications, 4-5 day intervals.	Same as above, 10-15 lbs. or calcium arsenate 10 lbs.	Dieldrin, aldrin, GBHC, heptachlor or toxaphene; 3 nozzles.
Bollworm (controlled efficiently only when small)	When weekly counts show 10-15 eggs or 4 or 5 small worms per 100 terminals.	20% toxaphene or 5% DDT with GBHC, aldrin, or dieldrin 15-20 lbs. per acre. 10% DDT, 10-15 lbs. Note: DDT alone may bring on aphids or red spider	DDT 1 to 1.5 lbs. per acre, 3 nozzles. If poisoning for weevil, add .5 lb. DDT to weevil insecticide for bollworm.
Leafworm	When worms appear, repeat as needed.	20% toxaphene, GBHC, calcium arsenate, 10-15 lbs.	Toxaphene, GBHC. 3 nozzles.
Aphids*	At first honeydew, repeat as needed.	3% GBHC, 12-15 lbs. 3% nicotine 10-12 lbs.	GBHC or TEPP. 3 nozzles.
Tarnished and rapid plant bugs, fleahoppers	10 to 35 per 100 terminals.	Same as for boll weevil except calcium arsenate.	Same as for boll weevil.
Red Spiders*	When leaves start to turn color, repeat as needed.	3% aramite, 10-15 lbs. per acre.	TEPP .08 to .25 lb. per acre. Aramite .5 lb. 3 nozzles.
Yellow-striped armyworm and garden webworm	When worms appear.	20% toxaphene and 1½% dieldrin and 5% DDT, 15 lbs. per acre	Toxaphene 3 lbs. or .15 lb. dieldrin plus .5 lb. DDT. 3 nozzles.

*Parathion is an extremely dangerous poison. However, in emergency situations its use may be justfied where qualified personnel are in a position to assume full responsibility and enforce all proper precautions as prescribed by manufacturer. If malathon and metacide are available, they can be used for aphid control and are much less hazardous.

weevil live in young cotton before the plants begin to square?

A. Average 8 days, maximum 40 days (90 percent die within 10 days.)

Q. How long will a boll weevil live in cotton that is fruiting?

A. Males about 20 days, females about 16 days.

Q. How old must a female boll weevil be before she can lay eggs?

A. Approximately 5 days.

Q. How many eggs does a boll weevil lay?

A. Average 81.2, range from 1 to 440.

Q. How long does it take a boll weevil to develop in a cotton square?

A. From an average of 17.6 days for first generation to 33.5 days for fourth generation; average for all generations 18.3 days.

Q. How old must a square be before it is attacked by boll weevils?

A. About 5 days.

Q. What influences boll weevil migration?

A. The main factor is the available food supply.

Q. What influences boll weevil emergence in the spring?

A. Moisture and high temperatures are the main factors. High temperatures without moisture will not bring many weevils out of hibernation.

Q. What percent of hibernating weevils have emerged by July 1?

A. Approximately 99.7%.

Q. Will a feeding puncture made by a boll weevil cause a square to shed?

A. Yes, but not always.

Q. Why must insecticide be applied at least 3 times at 5-day intervals for weevil control?

A. To have a supply of poison on the plant the entire length of the 17.6 day weevil life cycle. Also to keep new growth covered.

SERVING COTTON GINS AND OIL MILLS

WHO ARE THE READERS?

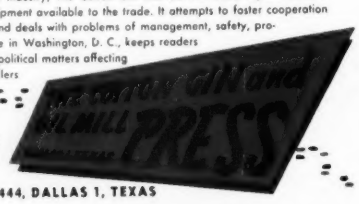
The paid subscribers to The Cotton Gin and Oil Mill Press are cotton ginners and oilseed processors from California to the Carolinas. Total distribution (June 30, 1950) was 7113. This includes approximately 85% of the active cotton gins in the nation, plus complete coverage of the processors of cottonseed, soybeans, peanuts, flaxseed, and tung nuts.

ADVERTISING ACCEPTANCE?

For 52 years leading industrial firms have used The Cotton Gin and Oil Mill Press to promote the sale of machinery, power units, auxiliary equipment and supplies. This publication is now in the unusual but gratifying position of being the only magazine which exclusively serves the cotton ginning and oilseed processing industries. This field represents an invested capital of $750,000,000 . . . ten percent of which ($75,000,000) is spent each year for replacements, repairs, and new equipment.

EDITORIAL COVERAGE?

Covering not only current news of the industry, The Cotton Gin and Oil Mill Press reports on new products, new processes, and new equipment available to the trade. It attempts to foster cooperation between all branches of the industry, and deals with problems of management, safety, production, and research. A representative in Washington, D. C., keeps readers constantly informed on legislative and political matters affecting the industry. Cotton ginners and oil millers have looked to this publication for complete news of the industry since 1899.



Concentrate YOUR SALES MESSAGE TO THE GIN AND OIL MILL IN . . .

ADDRESS ALL INQUIRIES TO P. O. BOX 444, DALLAS 1, TEXAS

1952 Cotton Insect Control Recommendations for:

Texas

Insects are a major threat to economical cotton production, but they can be profitably controlled if growers will use the right poisons at the right time. **Poisons must cover the plants to kill insects.** When they put on new growth, or the poison is washed off, plants are no longer protected.

On fertile soils where damaging infestations of boll weevils and bollworms occur, big profits have been made by controlling these pests. This has been true **even when a large number of poison applications was necessary for maximum yields.** On upland soils where insect infestations do not last so long, fewer applications may be needed. But they must be made in time to prevent loss of plant vigor, squares, or bolls due to insect damage.

The recommended control program for 1952 is divided into three important phases:

1. Early Season Control.
2. Late Season Control, based on infestation.
3. Early Stalk Destruction and Farm Cleanup.

Each individual grower must carry out the **complete** program if he expects to obtain the greatest benefits. He should make full use of all control measures that will help him get the highest possible acre yields, at the most profit.

Early Season Control

Early season control insures early fruiting and earlier maturity in all areas of the State where thrips, aphids, fleahoppers or boll weevils, alone or in combination, cause damage every year. **Generally, two to four applications made at approximately 7-day intervals give effective control.**

Thrips, aphids, fleahoppers and boll weevils cause more damage in some areas of the State than in others. In these areas of greater damage, three or four applications may be needed. The first usually should be made when the cotton is in the 4-leaf stage. The two seedling leaves are not true leaves and should not be counted. In some cases, however, it may be necessary to treat earlier to prevent loss of stand by thrips, aphids, cutworms or certain armyworms.

Overwintered boll weevils begin to lay eggs when the oldest squares are about 1/3 grown. On reasonably early planted cotton, the last early season application of poison should be made when plants reach this stage of development. Use the maximum dosage for insecticides recommended in the Table for early season control. This will reduce the first generation of weevils.

Regardless of the number of applications in the early season program, **the last should be made at least 30 days before the bollworm usually appears,** unless fleahopper or boll weevil infestations are extremely heavy. This period allows time for beneficial insects to build up in sufficient numbers to give some protection against bollworms. Individual fields or farms may receive considerable benefits from early season control but **it is most effective when practiced on a community - wide or county - wide basis.**

The larger the area treated the greater the benefits.

Under some conditions early season applications may afford adequate protection for the entire season. However, in case of severe infestation, additional applications may be needed. In any case, **the use of early season applications is a valuable supplement to complete seasonal control.**

Sprays have given more effective and more economical control of insetcs attacking young cotton than dusts. Because of the small size of the plants, a greater concentration of the insecticides is obtained from a spray. Frequently, effective spraying can be accomplished at times during the day when dusting is ineffective.

Effect of Insecticides on Beneficial Insects

Any insecticide that is immediately effective against injurious insects is also highly destructive to beneficial insects. Those insecticides having strong contact action are much more destructive and are hazardous to use. Such insecticides as DDT, BHC, aldrin, dieldrin, heptachlor and the phosphorus compounds have strong contact action. Improper use of any of these insecticides is more likely to produce increased populations of either aphids, red spiders, or bollworms during any season of the year.

Late Season Control

Late season control depends on the severity of infestation. **Insecticides should be applied when needed no matter whether early season control was followed or not.** The number of applications needed for control varies according to the insect infestation and amount of injury. Moisture and growing condition of plants should be considered. In other words, there is no point in applying insecticides if cotton is not growing or able to put on fruit, except for late applications for boll protection.

Responsibility for controlling insects rests squarly on the grower's shoulders. Under GENERAL will be found information on how to make insect counts. **Each grower should be able to identify insects, make his own counts and evaluate the damage in order to properly control insects.** The effectiveness of an insect control program depends upon the proper use of recommended poisons. **They must be properly applied at the right time.**

For late season control of boll weevil and bollworm to be successful, treatment should begin when recommended and continue at 5-day intervals until infestations are reduced below the damaging point. The dosage should be increased with the size of the plant and severity of the infestation. All effective combinations of insecticides, and not necessarily preferred insecticides, have been recommended. SEE TABLE FOR SPECIFIC CONTROL RECOMMENDATIONS.

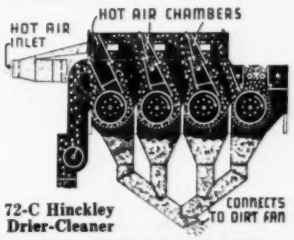
Early Stalk Destruction And Farm Cleanup

Plowing under cotton stalks immediately after harvest, and as far as possible in advance of the first frost, will reduce the boll weevil population. Early stalk destruction forces the boll weevil into a starvation period before time to enter winter quarters. **This prevents a late season buildup of weevils and reduces the number that survive the winter.** To obtain best results, stalks should be

HINCKLEY

Gin Supply Co., 4008 Commerce
Dallas 1, Texas

REPEAT ORDERS form a large percent of our business. Users KNOW what a wonderful machine the Hinckley Fan Drum Drier-Cleaner is.



72-C Hinckley Drier-Cleaner

HINCKLEY GIN SUPPLY COMPANY
4008 Commerce St. Dallas 1, Texas

2 National Favorites!

Wesson Oil

Preferred for America's Salads. . . . More popular every day for Stir-N-Roll pastry and biscuits!

Snowdrift

Pure vegetable shortening . . . Emulsorized for quick-method cakes . . . makes digestible, good-tasting fried foods.

WESSON OIL & SNOWDRIFT SALES COMPANY
NEW YORK — NEW ORLEANS — SAVANNAH — SAN FRANCISCO — HOUSTON — CHICAGO

MODERN STEEL STORAGE
All-Steel Self-Filling Non-Combustible
BUILDINGS

For—
• COTTON SEED
• SOY BEANS
• PEANUTS

Designed, Fabricated and Erected
Confer with us on your storage problems

MUSKOGEE IRON WORKS
Muskogee, Oklahoma

completely destroyed to prevent new growth and eliminate volunteer plants.

Plans must be made in advance, and these plans put into action, to insure an early harvest. Early planting of fast-maturing varieties and early season insect control will enable many farmers to complete harvest before frost. Early harvest means better grades of lint and higher quality seed.

Pastures, roadsides, ditch banks, fence rows and other overwintering quarters should be kept free of weeds and debris that harbor insects. Clean up such places by mowing, discing, or with a stalk cutter so as not to create an erosion problem.

Early destruction of stalks by individual growers is worthwhile, **but community-wide or county-wide destruction is still better.** In the southern part of the pink bollworm regulated area, an organization is already set up to get this important job done. In other counties where the crop can be harvested before frost, **an organized effort should be made to secure cooperation on a community-wide and county-wide basis.**

In the northwestern part of the state where this cannot be done, stalks should be left standing until after a hard freeze, for pink bollworm control; then they should be plowed under as deep as possible.

• Pink Bollworm

The pink bollworm situation has become extremely serious. Not only has infestation spread extensively but for the first time since its introduction into Texas considerable pink bollworm damage throughout south Texas is expected during 1952. The State Department of Agriculture and the Bureau of Entomology and Plant Quarantine are cooperating in a vigorous control program.

Cultural practices including regulated dates for planting and destruction of stalks are specified by the State Department of Agriculture. They are still the most effective means of combating the pink bollworm.

DDT is effective for pink bollworm control if used at the rate of at least 1½ pounds of technical material per acre at each application, either as dust or spray. See chart for late season control. **The Texas Agricultural Extension Service urges support of the pink bollworm regulations and also suggests careful study of individual need for insecticidal control.**

General

Recommendations for late season control are based on infestation records. **The grower must learn to make accurate counts at the proper time if he is to use poison most profitably.**

• Fleahopper

1. Make weekly examinations. Begin when cotton is old enough to produce squares.

2. Examine the main-stem terminal "bud" (about 3 or 4 inches of the top of the cotton plant) of 100 cotton plants. Count both adults and nymphs. These examinations should be made at several representative points in the field.

• Boll Weevil

1. Make weekly examinations for boll weevil. Begin after the plants are squaring freely or have produced as many as 3 squares per plant, at least 1/3 grown. Pick 100 squares as you walk diagonally across the center of the field. Squares

Recommendations for Insect Control in Texas

Early Season Control Program

INSECTS	BEGIN TREATMENT	DUST PROGRAM	SPRAY PROGRAM (Based on active ingredients per acre)
Cutworms and certain Armyworms	When needed	10% DDT, or 20% toxaphene, 15 to 20 lbs. per acre as needed.	Toxaphene, or 2-1 mixture[1], 2 to 3 lbs.; or DDT, 1 to 2 lbs. per acre as needed.
Thrips and Fleahoppers only	4-leaf stage or earlier if necessary	10% toxaphene-40% sulfur, or 3-5-40 mixture[2], or 2½% aldrin-40% sulfur, or 2½% dieldrin-40% sulfur, or 5% DDT-75% sulfur, 7 to 10 lbs. per acre, 7-day intervals.	Toxaphene, ¾ lb.; or aldrin, ⅛ lb.; or dieldrin, 1/10 lb.; or DDT, ½ lb. per acre, 7-day intervals.
Boll Weevil[3], Thrips and Fleahoppers	4-leaf stage or earlier if necessary	20% toxaphene-40% sulfur, or 3-5-40 mixture[2], or 2½% aldrin-40% sulfur, or 2½% dieldrin-40% sulfur, or 5% heptachlor-40% sulfur, 7 to 10 lbs. per acre, 7-day intervals.	Toxaphene, ¾ to 1½ lbs.; or aldrin, ⅛ to ¼ lb.; or dieldrin, 1/10 to 1/5 lb.; or heptachlor, ¼ to ½ lb.; or BHC, 1/6 to 1/3 lb. per acre, 7-day intervals.
Aphid	When needed	3-5-40 mixture[2], or 1% parathion, 10 to 15 lbs. per acre for "knockout," applied when air is calm.	40% TEPP[6], ½ pint; or BHC, ½ lb.; or parathion[6], ⅛ lb. per acre for "knockout."

Late Season Control Program

Boll Weevil	25 to 35% infestation	20% toxaphene-40% sulfur, or 3-5-40 mixutre[2], or calcium arsenate, or lime-free calcium arsenate plus 1% parathion, or 2½% aldrin-5% DDT-40% sulfur, or 2½% dieldrin-5% DDT-40% sulfur, 10 to 15 lbs. per acre, 5-day intervals.	2-1 mixture[1], or toxaphene, 2 to 3 lbs.; or aldrin-DDT (1-2), or dieldrin-DDT (1-2), ¾ to 1½ lbs. per acre, 5-day intervals.
Bollworm	When eggs and 4 or 5 worms are found per 100 terminals	20% toxaphene-40% sulfur, or 3-5-40 mixutre[2], or calcium arsenate, or lime-free calcium arsenate plus 1% parathion, or 2½% aldrin-5% DDT-40% sulfur, or 2½% dieldrin 5% DDT-40% sulfur, or 10% DDT-40% sulfur[5], 10 to 15 lbs., 5-day intervals; or 2-10-40 mixutre[5], 15 lbs. per acre preferred for heavy infestations, 5-day intervals.	2-1 mixture[1], 3 lbs.; or aldrin-DDT (1-2), or dieldrin-DDT (1-2), 1½ lbs.; or DDT[7], 1 to 1½ lbs. per acre, 5-day intervals.
Aphid	When honey-dew first appears	3-5-40 mixture[2], or 1% parathion, 10 to 15 lbs. per acre for "knockout."	40% TEPP[6], ½ pint; or 3-5 mixture[4], 1.1 lbs.; or parathion[6], ⅛ to ¼ lb. per acre for "knockout."
Red Spider	When leaves begin to turn yellow or rusty brown	Sulfur, 20 to 25 lbs.; or 1% parathion, or 3% aramite, 10 to 15 lbs. per acre as needed.	Aramite[7], ⅛ to ¾ lb.; or parathion[6], ⅛ to ¼ lb. per acre as needed.
Fleahopper	15 to 35 per 100 terminals	5% DDT-75% sulfur, or 10% toxaphene-40% sulfur, 10 lbs. per acre, 7-10 day intervals.	Toxaphene, or 2-1 mixture[1], ¾ lb.; or DDT, ½ lb. per acre, 7-10 day intervals.
Lygus and other Plant Bugs	When damaging infestation appears	5% DDT-75% sulfur, or 10% toxaphene-40% sulfur, 10 lbs. per acre, 7-10 day intervals.	Toxaphene, or 2-1 mixture[1], ¾ lb.; or DDT, ½ lb. per acre, 7-10 day intervals.
Stink Bugs	When damaging infestation appears	20% toxaphene-40% sulfur, or 3-5-40 mixture[2], or 2-10-40 mixture[5], or 10% DDT[8], 10 to 15 lbs. per acre, 7-day intervals.	Toxaphene, or 2-1 mixture[1], 2 to 3 lbs.; or DDT[8], 1 to 1½ lbs. per acre, 7-day intervals.
Leafworm	When worms first appear	Same as recommended for boll weevil when needed, except omit aldrin-DDT and dieldrin-DDT.	Toxaphene, or 2-1 mixture[1], 1 to 2 lbs. per acre as needed.
Grasshoppers	When damaging infestation appears	20% toxaphene-40% sulfur, or 3-5-40 mixture[2], or 10% chlordane-40% sulfur, 15 to 20 lbs.; or 2½% aldrin-40% sulfur, or 2½% dieldrin-40% sulfur, 8 to 15 lbs. per acre as needed.	Toxaphene, or chlordane, 1½-3 lbs.; or dieldrin, or aldrin, ⅛ to ¼ lb. per acre as needed.
Pink Bollworm	When needed (see text)	2-10-40 mixture[2], 15 to 18 lbs.; or 20% DDT-40% sulfur, 12 to 15 lbs. per acre, 7-day intervals.	DDT[8], 2 to 3 lbs. per acre, 7-day intervals.

[1] A spray concentrate containing 2 parts toxaphene and 1 part DDT.

[2] The maximum dosage for weevil control.

[3] 3% gamma benzene hexachloride-5% DDT-40% sulfur.

[4] 3 parts gamma benzene hexachloride-5 parts DDT. Also effective for boll weevil and bollworm.

[5] 2% gamma benzene hexachloride-10% DDT-40% sulfur.

[6] Parathion and TEPP may be used in mixtures with other sprays for aphid or red spider "knockout" (see caution).

[7] Aramite may be used in mixtures with other sprays for red spider "knockout."

[8] Damaging infestations of aphids are likely to develop.

should be about 1/3 grown or larger. An equal number should be picked from the top, middle and lower branches of the plants. When 100 squares have been picked, examine them for weevil punctures to determine the per cent infested.

2. At least 2 or 3 applications of poison at 5-day intervals are required. Pioson will effectively control the adults; therefore, more than 1 application is needed to kill the adults as they develop from the punctured squares. Frequently, more than 3 applications are necessary when infestations are heavy and growing conditions are good.

3. When weevils are found in injurious numbers late in the season after the crop is set and squares are scarce, one or more applications of poison should be made to protect the bolls.

• **Bollworm**

1. When most of the corn silks begin to dry, or at the time bollworms usually appear, start examinations for bollworm eggs on cotton. Continue every 5 days until the crop has matured. In general, these dates will be as follows, but check with your County 7-Step Cotton Committee:

Lower Rio Grande Valley and Coastal Bend Area, second and third weeks in June.

South Texas, first week in July.

Central Texas, second week in July.

North Texas, third week in July.

2. Examine 100 plant terminals as indicated for fleahopper.

3. If bollworm eggs are found on the terminals and 4 or 5 young worms are found in small squares or on tender top leaves, infestation is high enough to start treatment. When they are first deposited on the plants, bollworm eggs are white and about the size of mustard seed. As hatching time nears, they change to a dirty white color. These eggs usually will be found scattered on the terminal portions of the plant.

4. To obtain effective control, no time should be lost in applying poisons after eggs and 4 or 5 young worms are found. Apply poison at 5-day intervals as long as necessary.

Past experience has shown conclusively that the use of DDT alone for bollworm control greatly increases the possibility of injurious aphid infestation. Any grower who uses DDT alone should be prepared for a "knockout" control for aphids. An aphicide can be used alone or in combination with other insecticides.

* * *

Booklets showing cotton pests, with their life history, are available from County Agricultural Agents for free distribution to growers.

Experiments show that dusts and sprays are equally effective in most areas when properly applied. To be effective, repeat applications must be made if the poison is washed off within 24 hours.

Dust applications should be made when the air is calm or nearly so. The presence of dew is not necessary. When ground machines are used, the dust nozzles should be placed 4 to 6 inches over the tops of plants.

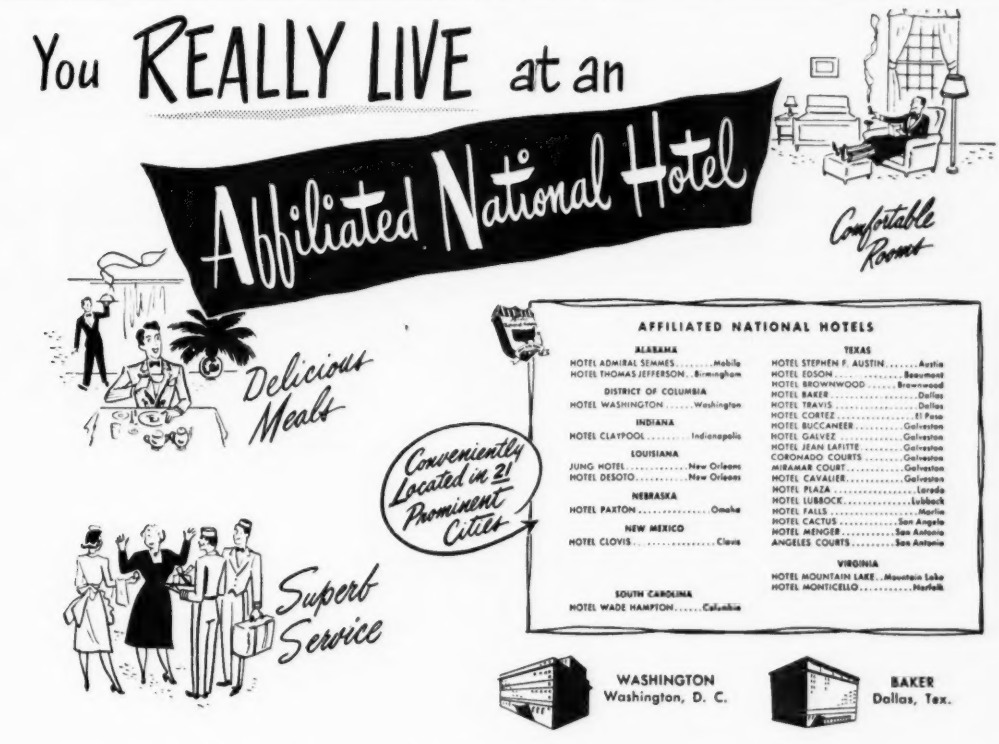
Spray applications may be made at any time when winds do not exceed 15 to 20 miles per hour. Spray when plants are dry so the material will stay on the leaves. Poison runs off when leaves are wet. For early season treatment with ground equipment, 1 to 2 cone type nozzles per row, placed 6 to 9 inches over the tops of plants, are sufficient. As plants increase in size, number of nozzles should be increased until a maximum of 3 is in use. Sprays should be applied at approximately 60 pounds pressure and at a volume of 2 to 8 gallons per acre. As a safety measure, it is recommended that spray booms be mounted on rear of the tractor.

Both ground machines and airplanes are effective for applying poison. For best results with airplanes, it is essential to flag the swaths so they will meet or overlap. Increase dosage recommended in Table at least 50% when an airplane is used for making early season applications.

Under high temperatures some organic insecticides have less residual effect and higher dosages may be required to be effective. Because of climatic differences in the Lower Rio Grande Valley a SUPPLEMENTAL GUIDE is available for this area.

Some cotton poisons are very destructive to honey bees, and since they are important for pollination of many agricultural crops, a determined effort should be made to prevent their destruction.

CAUTION: All insecticides are poisons and precautions given on the labels should be strictly followed. Special precautions should be taken in handling TEPP and Parathion to avoid prolonged contact with the skin or breathing the vapors or drift from either spray or dust.



At the Midsouth Cotton Gin Exhibit, Memphis, Tenn., March 10, 11, 12

See . . .

AUTOMATIC CONTROL STATIFIERS THAT **WORK!**

Write for Names of Users of This Equipment in the Eastern Cotton Belt

STATIFIER* CONCENTRATES

Make "wetter" wet water that penetrates cotton quickly with less wetting of the lint slide and kicker.

Statifier wet water concentrates are used across the U.S. Cotton Belt and in the cotton growing countries of the world to restore moisture to dry cotton at the lint slide at a cost of less than 2 cents per bale. They put out cotton fires and "fire packed" bales; control static electricity in gins, reducing the fire hazard; and are used to lubricate the spindles of mechanical pickers.

For information and prices write:

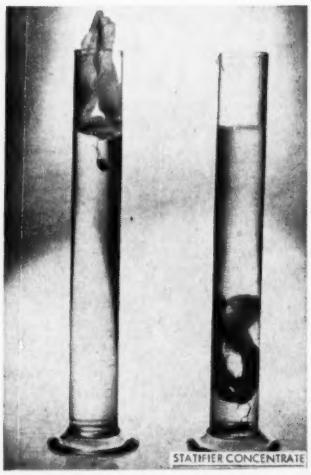
KEMGAS PROCESS COMPANY

2414 Fifteenth St. **Phones 2-3692—2-2894**

LUBBOCK, TEXAS

Originators of Statifier Moisture Restoration

*Trade mark registered



THIS IS THE DRAVES SINKING TIME TEST—official test for wetting agents of the American Association of Textile Chemists and Colorists. The small weights attached to skeins of yarn weigh 1½ grams.

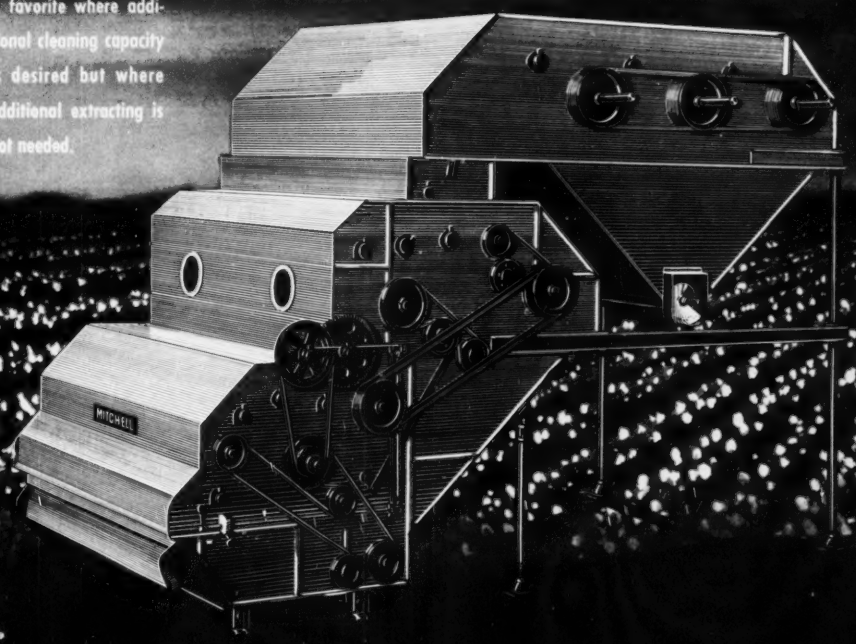
Statifier Concentrate is in the graduate at right, and a widely advertised wetting agent is in the other graduate.

The skein in the solution made with Statifier Concentrate had already sunk to bottom by the time the other skein started to sink. Both graduates have ¼th of 1% solution of wet water. This is in the proportion of one pint of wetting agent in 50 gallons of water.

MITCHELL *Combinations*

3-Cylinder Cleaner and Super Unit

A favorite where additional cleaning capacity is desired but where additional extracting is not needed.



JOHN E. MITCHELL COMPANY

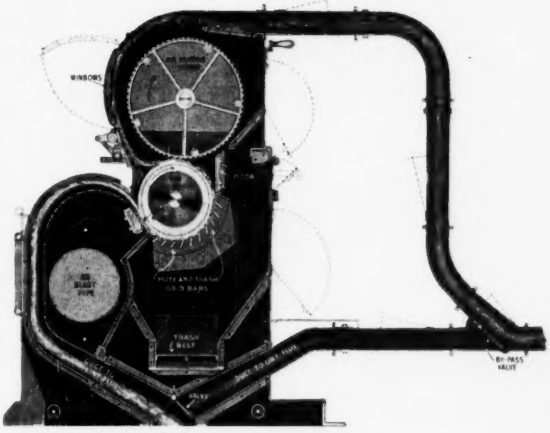
Manufacturers of Fine Machinery for more than 45 Years

DALLAS, TEXAS

HARDWICKE-ETTER COMPANY

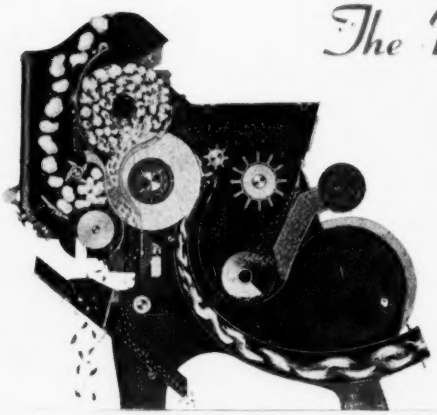
LINT CLEANER

Efficient
Improves Sample
Fits Any Make Gin
No Damage to Fiber
Simple in Operation
Ample Capacity for 90-Saw Gin
Profitable to Ginner & Producer



Write for special bulletin

HARDWICKE-ETTER COMPANY
MANUFACTURERS **Sherman, Texas**



The New **MURRAY** **90** *Saw Gins*

This NEW 90-SAW GIN incorporates the use of a Grid or Stripper Bar located just above Nozzle, with a revolving rubber flight Roller to keep Grid Bar and top of Nozzle clean of trash accumulation, and a second rubber flight Roller located to the rear of first Roller mentioned, with edges of the two Rollers forming live or self-cleaning surfaces.

This combination of Grid Bar and Mote Suction device REMOVES and KEEPS OUT of LINT STREAM a MUCH GREATER volume of motes and trash which definitely improves the sample.

Write for Bulletin No. 47

THE MURRAY COMPANY OF TEXAS, INC.

DALLAS • MEMPHIS • ATLANTA